

PORT INTERMODAL EXPANSION PROJECT

North End Runway Material Extraction and Transport Environmental Assessment

Final



**Anchorage Port
Expansion Team**

May 2006

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 12 JUN 2006		2. REPORT TYPE		3. DATES COVERED 00-00-2006 to 00-00-2006	
4. TITLE AND SUBTITLE North End Runway Material Extraction and Transport Environmental Assessment				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Clarus Technologies LLC,11901 Business Boulevard, Suite 105,Eagle River,AK,99577				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 184	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

**MARITIME ADMINISTRATION/PORT OF ANCHORAGE
FINDING OF NO SIGNIFICANT IMPACT/
FINDING OF NO PRACTICABLE ALTERNATIVE
FOR THE
NORTH END RUNWAY MATERIAL EXTRACTION
AND TRANSPORT PROJECT**

1.0 NAME OF THE PROPOSED ACTION

North End Runway Material Extraction and Transport Project at Elmendorf Air Force Base (Project).

The Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) were prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) and its implementing regulations (Council on Environmental Quality, 40 CFR 1500-1508). The Finding of No Practicable Alternative (FONPA) was prepared in accordance with the Secretary of the Air Force Order 791.1 and Executive Order 11990 (May 24, 1977), "Protection of Wetlands."

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The U.S. Department of Transportation, Maritime Administration (MARAD), in cooperation with Elmendorf Air Force Base (EAFB) and the Bureau of Land Management (BLM), proposes to remove approximately 9.8 million bank cubic yards of material from the North End Borrow Site and improve a roadway between the borrow site and the Port of Anchorage (POA or Port) for truck transport. The 255-acre proposed North End Borrow Site, which includes several borrow pits historically and currently used by EAFB, is located 4.75 miles northeast of the POA and immediately north of the EAFB North/South Runway. The purpose of the action is to meet a portion of the fill requirements for the planned 135-acre expansion of the Port, known as the Marine Terminal Redevelopment (MTR).

The MTR will support existing and projected new demands for Port services. A key component of accomplishing the goal of this expansion is the requirement of substantial amounts of imported fill to gain needed acreage. The MTR EA was prepared as a separate action for the POA expansion and a FONSI was signed on March 9, 2005. The North End Runway Material Extraction and Transport Draft EA assesses impacts

specifically from the use of the North End Borrow Site and proposed transportation corridor to the Port.

MARAD and the POA undertook an identification process that involved evaluating the purpose and need for the action in order to establish criteria for a fill material source. These criteria were: 1) sufficient quantity and quality of material; 2) availability and capacity; and 3) transportation distance and access via truck, rail, or barge. The identification process determined that, of the options available, the North End Borrow Site represented a location capable of fulfilling the purpose and need. A separate but related action proposes to meet the remaining portion of the MTR project fill requirements by utilizing the EAFB Cherry Hill Borrow Site. Additional alternatives for fill material sources were considered, but were not carried forward, because of their failure to meet the purpose and need of the action.

Other alternatives analyzed for the Proposed Action included excavation at the North End Borrow Site with minimal roadway improvements, and "No Action". The "No-Action" Alternative consisted of acquiring all fill from other off-site, commercially-available sources. These alternatives are described in detail in the Draft EA, dated March 2006, in Chapter 2.0, "Description of Proposed Action and Alternatives" and in Chapter 3.0, "Affected Environment and Environmental Consequences." MARAD and the POA identified the Preferred Alternative to be "Excavate from the North End Borrow Site and Improve Roads for Truck Transport."

Preferred Alternative - Excavate from the North End Borrow Site and Improve Roads for Truck Transport.

Implementing the Preferred Alternative would involve four major components: 1) clearing and grubbing activities; 2) construction and improvement of the proposed haul route; 3) extraction and transport of material; and 4) pit-reclamation/re-vegetation. Material excavation under this action is anticipated to take up to six years. Extraction and transportation would most likely begin in 2006 to coincide with the MTR project schedule. Initial clearing and grubbing activities, as well as road improvements, would be scheduled to take place early in 2006.

Clearing and Grubbing. Removal of all hardwood and softwood trees, stumps and deadfall, shrubs and bushes, and excavation of an approximately two-foot deep organic

overburden layer with industry standard equipment would occur. Clearing of vegetation would be conducted outside of the bird nesting season as recommended by U.S. Fish and Wildlife Service. Procedures to protect denning bears and/or orphaned bear cubs encountered during excavation will be developed by MARAD and EAFB natural resources staff.

Construct/Improve Proposed Haul Route. An unpaved haul route would be created between the North End Borrow Site and the POA, using existing roads and trails along most of the alignment. The route will be adjusted to avoid adjacent wetlands to the extent practicable. Two-way sections of road would be improved and/or widened to accommodate trucks of up to 100 tons in capacity. The improved road would be up to 70 feet in width. The construction/improvement to the proposed haul route will take place in accordance with a design approved by EAFB. The route would be designed to minimize impact to groundwater and on-going restoration activities and comply with existing regulatory clean-up agreements. During construction/improvement of the haul route, activities will comply with existing records of decision and other decision documents. No key monitoring wells will be damaged or destroyed.

Material Extraction and Transport. Excavating, loading, and transporting suitable materials off site would be conducted with industry standard equipment. As much as 1.5 to 2.0 million cubic yards of material could be removed in a given construction season. Although some on-site stockpiling of excavated material would occur, suitable material that meets engineering specifications would be regularly transported off site for use. Excavation would take place in accordance with a Mining Plan, to be developed with approval from EAFB, which would minimize impact to groundwater, monitoring wells, contaminated sites, and environmental restoration projects. Material would be transported to the MTR project via access corridors consistent with the Project boundaries. Precautions against the introduction of invasive plant species will be undertaken.

Reclamation and Re-vegetation. Stockpiled and blended reject and organic material would be spread throughout the post-mined North End Borrow Site to contours detailed in final design specifications. This material would be revegetated for erosion control in a manner to encourage regrowth and regeneration of naturally occurring woody plants, and to minimize aircraft bird strike hazards. Replanting may be required in areas where natural regrowth fails. The actual species mixtures, re-vegetation processes, plant densities, and monitoring programs would be defined by MARAD and EAFB in annual

reclamation plans reviewed and approved by EAFB, BLM, and the Alaska Department of Natural Resources (ADNR) as appropriate. Pedestrian pathways within the project limits would be restored to pre-existing conditions as consistent with EAFB long-term plans for the area.

No-Action Alternative

Under the No-Action alternative, MARAD and the POA would not implement the proposed Project. Instead, fill from other off-site sources would be used to provide for POA expansion activities. Under this alternative, all imported material would be purchased competitively from commercial providers, non-commercial providers, or a combination thereof. Material would be transported by public road, commercial rail, and/or barge.

3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

According to the analysis in the EA, with the incorporation of best management practices for resources described herein, as well as incorporation of specific regulatory permit requirements, implementation of the Preferred Alternative would not result in significant adverse impacts to human health or the natural environment. A summary of the potential impacts of the Preferred Alternative is presented below by resource category.

Air Quality and Noise: Excavation activity and truck traffic to the POA would result in a temporary increase in air emissions and noise. Airborne pollutants would include carbon monoxide, sulfur dioxide, nitrogen oxides, volatile organic compounds, and particulate matter. The air emission and noise sources from this Project are largely mobile and intermittent in nature and the impacts would not be large enough in the localized area to cause an exceedence of any applicable ambient air quality standard or noise control ordinance.

Vegetation and Wildlife: Short-term losses to vegetation and wildlife habitat would occur. However, annual reclamation and revegetation activities would replace these resources and minimize the total acreage impacted at any one time. Recreational access to two stocked fishing lakes would be maintained via improvements to existing roads and development of a new pedestrian trail.

Wetland Resources: Eleven wetland areas totaling 12 acres are located within the North End Borrow Site and would be removed through this action. In addition, a potential wetland, less than 1/2 acre in size, exists along the haul route from the North End Borrow Site to the Cherry Hill Borrow Site. Removal of these wetlands would result in adverse impacts; however, this action is consistent with the U.S. Air Force Bird Air Strike Hazard Program (BASH) and should reduce the ongoing migratory bird depredation take. Because fill material surrounds the area, it is neither practicable nor cost effective to design the excavation around the wetlands or to preserve the wetlands. The Preferred Alternative would be carried out in accordance with the requirements of a U.S. Army Corps of Engineers wetlands permit and appropriate mitigation provided. This could be a combination of compensatory, off-site (outside project boundary), and on-site mitigation.

The Preferred Alternative was also compared to other past, present, and reasonably foreseeable actions in the area. No significant adverse cumulative impacts on the environment were found to occur through the interaction with past, present, and foreseeable future actions. Those resources that involve an irreversible or irretrievable commitment are:

- Extraction of 9.8 million bank cubic yards of fill from the North End Borrow Site;
- Removal of 12 acres of wetlands; and
- Use of various nonrenewable petroleum products for trucks, vehicles, and loading/unloading equipment.

Most other resource commitments are neither irreversible nor irretrievable. Anticipated impacts are primarily short term.

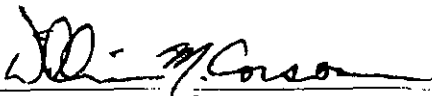
4.0 CONCLUSIONS

Finding of No Significant Impact: On the basis of the findings of the EA, with the incorporation of best management practices for resources described herein, as well as incorporation of specific regulatory permit requirements, implementation of the Preferred Alternative would not result in significant adverse impacts to human health or the natural environment. Therefore, a FONSI is warranted, and preparation of an Environmental Impact Statement, pursuant to the National Environmental Policy Act of 1969 (Public Law 91-190) is not required.

This FONSI is based on the contractor-prepared EA, which has been independently evaluated by the MARAD/POA. A Notice of Availability of the draft EA was published in the Federal Register on March 17, 2006. The EA adequately and accurately discusses the environmental issues, proposed mitigation, and impacts of the proposed project and provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required.

Finding of No Practicable Alternative: Pursuant to Executive Order 11990, *Protection of Wetlands*, the authority delegated in the Secretary of the Air Force Order 791.1 and the written redelegations accomplished pursuant to the Order, and in consideration of the above information, there is no practicable alternative to implementing the Proposed Action in minimizing potential harm to wetlands. A Final EA, dated May 2006, is hereby incorporated by reference, and is on file at the Z. J. Loussac Library, 3600 Denali Street, Anchorage, AK 99503-6055.

The US Air Force, as represented by Elmendorf Air Force Base (EAFB), a cooperating federal agency during the development of the EA, concurs with MARAD findings and adopts the Final EA and FONSI/FONPA for military use.


WILLIAM M. CORSON, Colonel, USAF
Director, Installations and Mission Support
Pacific Air Forces

30 May 06
Date

I have considered the information contained in the EA, which is the basis for this FONSI/FONPA. Based on the information in the EA and this FONSI/FONPA, I agree that the Proposed Action and Preferred Alternative, as described above and in the EA, will have no significant impacts on human health or the environment.


MARGARET D. BLUM

Associate Administrator for Port, Intermodal, and Environmental Activities
US Department of Transportation Maritime Administration

6/12/06
Date

**MARITIME ADMINISTRATION/PORT OF ANCHORAGE
FINDING OF NO SIGNIFICANT IMPACT/
FINDING OF NO PRACTICABLE ALTERNATIVE
FOR THE
NORTH END RUNWAY MATERIAL EXTRACTION
AND TRANSPORT PROJECT**

1.0 NAME OF THE PROPOSED ACTION

North End Runway Material Extraction and Transport Project at Elmendorf Air Force Base (Project).

The Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) were prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) and its implementing regulations (Council on Environmental Quality, 40 CFR 1500-1508). The Finding of No Practicable Alternative (FONPA) was prepared in accordance with the Secretary of the Air Force Order 791.1 and Executive Order 11990 (May 24, 1977), "Protection of Wetlands."

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The U.S. Department of Transportation, Maritime Administration (MARAD), in cooperation with Elmendorf Air Force Base (EAFB) and the Bureau of Land Management (BLM), proposes to remove approximately 9.8 million bank cubic yards of material from the North End Borrow Site and improve a roadway between the borrow site and the Port of Anchorage (POA or Port) for truck transport. The 255-acre proposed North End Borrow Site, which includes several borrow pits historically and currently used by EAFB, is located 4.75 miles northeast of the POA and immediately north of the EAFB North/South Runway. The purpose of the action is to meet a portion of the fill requirements for the planned 135-acre expansion of the Port, known as the Marine Terminal Redevelopment (MTR).

The MTR will support existing and projected new demands for Port services. A key component of accomplishing the goal of this expansion is the requirement of substantial amounts of imported fill to gain needed acreage. The MTR EA was prepared as a separate action for the POA expansion and a FONSI was signed on March 9, 2005. The North End Runway Material Extraction and Transport Draft EA assesses impacts

specifically from the use of the North End Borrow Site and proposed transportation corridor to the Port.

MARAD and the POA undertook an identification process that involved evaluating the purpose and need for the action in order to establish criteria for a fill material source. These criteria were: 1) sufficient quantity and quality of material; 2) availability and capacity; and 3) transportation distance and access via truck, rail, or barge. The identification process determined that, of the options available, the North End Borrow Site represented a location capable of fulfilling the purpose and need. A separate but related action proposes to meet the remaining portion of the MTR project fill requirements by utilizing the EAFB Cherry Hill Borrow Site. Additional alternatives for fill material sources were considered, but were not carried forward, because of their failure to meet the purpose and need of the action.

Other alternatives analyzed for the Proposed Action included excavation at the North End Borrow Site with minimal roadway improvements, and "No Action". The "No-Action" Alternative consisted of acquiring all fill from other off-site, commercially-available sources. These alternatives are described in detail in the Draft EA, dated March 2006, in Chapter 2.0, "Description of Proposed Action and Alternatives" and in Chapter 3.0, "Affected Environment and Environmental Consequences." MARAD and the POA identified the Preferred Alternative to be "Excavate from the North End Borrow Site and Improve Roads for Truck Transport."

Preferred Alternative - Excavate from the North End Borrow Site and Improve Roads for Truck Transport.

Implementing the Preferred Alternative would involve four major components: 1) clearing and grubbing activities; 2) construction and improvement of the proposed haul route; 3) extraction and transport of material; and 4) pit-reclamation/re-vegetation. Material excavation under this action is anticipated to take up to six years. Extraction and transportation would most likely begin in 2006 to coincide with the MTR project schedule. Initial clearing and grubbing activities, as well as road improvements, would be scheduled to take place early in 2006.

Clearing and Grubbing. Removal of all hardwood and softwood trees, stumps and deadfall, shrubs and bushes, and excavation of an approximately two-foot deep organic

overburden layer with industry standard equipment would occur. Clearing of vegetation would be conducted outside of the bird nesting season as recommended by U.S. Fish and Wildlife Service. Procedures to protect denning bears and/or orphaned bear cubs encountered during excavation will be developed by MARAD and EAFB natural resources staff.

Construct/Improve Proposed Haul Route. An unpaved haul route would be created between the North End Borrow Site and the POA, using existing roads and trails along most of the alignment. The route will be adjusted to avoid adjacent wetlands to the extent practicable. Two-way sections of road would be improved and/or widened to accommodate trucks of up to 100 tons in capacity. The improved road would be up to 70 feet in width. The construction/improvement to the proposed haul route will take place in accordance with a design approved by EAFB. The route would be designed to minimize impact to groundwater and on-going restoration activities and comply with existing regulatory clean-up agreements. During construction/improvement of the haul route, activities will comply with existing records of decision and other decision documents. No key monitoring wells will be damaged or destroyed.

Material Extraction and Transport. Excavating, loading, and transporting suitable materials off site would be conducted with industry standard equipment. As much as 1.5 to 2.0 million cubic yards of material could be removed in a given construction season. Although some on-site stockpiling of excavated material would occur, suitable material that meets engineering specifications would be regularly transported off site for use. Excavation would take place in accordance with a Mining Plan, to be developed with approval from EAFB, which would minimize impact to groundwater, monitoring wells, contaminated sites, and environmental restoration projects. Material would be transported to the MTR project via access corridors consistent with the Project boundaries. Precautions against the introduction of invasive plant species will be undertaken.

Reclamation and Re-vegetation. Stockpiled and blended reject and organic material would be spread throughout the post-mined North End Borrow Site to contours detailed in final design specifications. This material would be revegetated for erosion control in a manner to encourage regrowth and regeneration of naturally occurring woody plants, and to minimize aircraft bird strike hazards. Replanting may be required in areas where natural regrowth fails. The actual species mixtures, re-vegetation processes, plant densities, and monitoring programs would be defined by MARAD and EAFB in annual

reclamation plans reviewed and approved by EAFB, BLM, and the Alaska Department of Natural Resources (ADNR) as appropriate. Pedestrian pathways within the project limits would be restored to pre-existing conditions as consistent with EAFB long-term plans for the area.

No-Action Alternative

Under the No-Action alternative, MARAD and the POA would not implement the proposed Project. Instead, fill from other off-site sources would be used to provide for POA expansion activities. Under this alternative, all imported material would be purchased competitively from commercial providers, non-commercial providers, or a combination thereof. Material would be transported by public road, commercial rail, and/or barge.

3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

According to the analysis in the EA, with the incorporation of best management practices for resources described herein, as well as incorporation of specific regulatory permit requirements, implementation of the Preferred Alternative would not result in significant adverse impacts to human health or the natural environment. A summary of the potential impacts of the Preferred Alternative is presented below by resource category.

Air Quality and Noise: Excavation activity and truck traffic to the POA would result in a temporary increase in air emissions and noise. Airborne pollutants would include carbon monoxide, sulfur dioxide, nitrogen oxides, volatile organic compounds, and particulate matter. The air emission and noise sources from this Project are largely mobile and intermittent in nature and the impacts would not be large enough in the localized area to cause an exceedence of any applicable ambient air quality standard or noise control ordinance.

Vegetation and Wildlife: Short-term losses to vegetation and wildlife habitat would occur. However, annual reclamation and revegetation activities would replace these resources and minimize the total acreage impacted at any one time. Recreational access to two stocked fishing lakes would be maintained via improvements to existing roads and development of a new pedestrian trail.

Wetland Resources: Eleven wetland areas totaling 12 acres are located within the North End Borrow Site and would be removed through this action. In addition, a potential wetland, less than 1/2 acre in size, exists along the haul route from the North End Borrow Site to the Cherry Hill Borrow Site. Removal of these wetlands would result in adverse impacts; however, this action is consistent with the U.S. Air Force Bird Air Strike Hazard Program (BASH) and should reduce the ongoing migratory bird depredation take. Because fill material surrounds the area, it is neither practicable nor cost effective to design the excavation around the wetlands or to preserve the wetlands. The Preferred Alternative would be carried out in accordance with the requirements of a U.S. Army Corps of Engineers wetlands permit and appropriate mitigation provided. This could be a combination of compensatory, off-site (outside project boundary), and on-site mitigation.

The Preferred Alternative was also compared to other past, present, and reasonably foreseeable actions in the area. No significant adverse cumulative impacts on the environment were found to occur through the interaction with past, present, and foreseeable future actions. Those resources that involve an irreversible or irretrievable commitment are:

- Extraction of 9.8 million bank cubic yards of fill from the North End Borrow Site;
- Removal of 12 acres of wetlands; and
- Use of various nonrenewable petroleum products for trucks, vehicles, and loading/unloading equipment.

Most other resource commitments are neither irreversible nor irretrievable. Anticipated impacts are primarily short term.

4.0 CONCLUSIONS

Finding of No Significant Impact: On the basis of the findings of the EA, with the incorporation of best management practices for resources described herein, as well as incorporation of specific regulatory permit requirements, implementation of the Preferred Alternative would not result in significant adverse impacts to human health or the natural environment. Therefore, a FONSI is warranted, and preparation of an Environmental Impact Statement, pursuant to the National Environmental Policy Act of 1969 (Public Law 91-190) is not required.

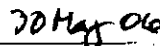
This FONSI is based on the contractor-prepared EA, which has been independently evaluated by the MARAD/POA. A Notice of Availability of the draft EA was published in the Federal Register on March 17, 2006. The EA adequately and accurately discusses the environmental issues, proposed mitigation, and impacts of the proposed project and provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required.

Finding of No Practicable Alternative: Pursuant to Executive Order 11990, *Protection of Wetlands*, the authority delegated in the Secretary of the Air Force Order 791.1 and the written redelegations accomplished pursuant to the Order, and in consideration of the above information, there is no practicable alternative to implementing the Proposed Action in minimizing potential harm to wetlands. A Final EA, dated May 2006, is hereby incorporated by reference, and is on file at the Z. J. Loussac Library, 3600 Denali Street, Anchorage, AK 99503-6055.

The US Air Force, as represented by Elmendorf Air Force Base (EAFB), a cooperating federal agency during the development of the EA, concurs with MARAD findings and adopts the Final EA and FONSI/FONPA for military use.

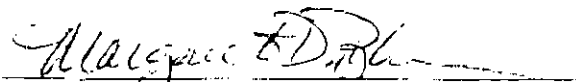


WILLIAM M. CORSON, Colonel, USAF
Director, Installations and Mission Support
Pacific Air Forces

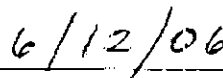


Date

I have considered the information contained in the EA, which is the basis for this FONSI/FONPA. Based on the information in the EA and this FONSI/FONPA, I agree that the Proposed Action and Preferred Alternative, as described above and in the EA, will have no significant impacts on human health or the environment.



MARGARET D. BLUM



Date

Associate Administrator for Port, Intermodal, and Environmental Activities
US Department of Transportation Maritime Administration

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1.0 PURPOSE AND NEED	13
1.1 Location and Description	13
1.2 Action Purpose and Need	14
1.3 National Environmental Policy Act (NEPA) Approach	19
2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES	21
2.1 Alternatives Identification Process	21
2.2 Alternatives Carried Forward for Detailed Analysis	23
2.2.1 Alternative 1: Excavate from the North End Borrow Site and Improve Roads for Truck Transport (Proposed Action)	23
2.2.2 Alternative 2: Excavate and Conduct Minimal Road Improvements	27
2.2.3 Alternative 3: “No-Action”	27
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	30
3.1 Physical Resources	30
3.1.1 Air Quality	30
3.1.2 Noise	36
3.1.3 Hazardous Materials and Waste	41
3.1.4 Visual Resources	46
3.2 Natural Resources	47
3.2.1 Geology and Soils	47
3.2.2 Ground Water	48
3.2.3 Vegetation	52
3.2.4 Wildlife	54
3.2.5 Threatened and Endangered Species	58
3.2.6 Surface Water	64
3.2.7 Wetland Resources	66
3.2.8 Other Resources	70
3.3 Human Resources	71
3.3.1 Cultural and Historic Resources	71
3.3.2 Socioeconomics	75
3.3.3 Environmental Justice	76
3.3.4 Land Use and Recreation	77
3.3.5 Impact Reduction Measures	82
4.0 CUMULATIVE EFFECTS, IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES	84
4.1 Cumulative Effects	84
4.2 Scope of Cumulative Effects Analysis	84
4.3 Evaluation of Actions Potentially Generating Cumulative Effects	84
4.4 Assessment of Cumulative Effects	89
4.5 Irreversible and Irretrievable Commitment of Resources	91
5.0 REFERENCES	93
6.0 PERSONS AND AGENCIES CONTACTED	96
7.0 LIST OF PREPARERS AND CONTRIBUTORS	97

LIST OF FIGURES

Figure 1	Vicinity Map
Figure 2	North End Borrow Site and Haul Route
Figure 3	North End Concept Grading Plan
Figure 4	ADNR Borrow Source Sites
Figure 5	Contaminated Sites
Figure 6	Wetland Delineation
Figure 7	Elmendorf Cultural and Historical Sites
Figure 8	Elmendorf Approach Routes and FLR-9 Antenna

LIST OF TABLES

Table ES-1	Summary of Potential Impacts by Resource Category
Table 3-1	Alternative 1: CO and PM-10 Emission Calculations from Diesel-Burning Equipment (Total Over Project)
Table 3-2	Alternative 1: Calculations for Fugitive Dust (Total Over Project)
Table 3-3	Alternative 1: CO and PM-10 Emission Calculations from Diesel-Burning Equipment for Road Improvements in 2006
Table 3-4	Alternative 1: Calculations for PM-10 Emissions from Material Screening (Total Over Project)
Table 3-5	Alternatives 1 and 2: CO and PM-10 Emissions from Diesel-Burning Equipment Used for Material Extraction (Total Over Project)
Table 3-6	Alternative 2: CO and PM-10 Emission Calculations from Diesel-Burning Equipment (Total Over Project)
Table 3-7	Alternative 2: PM-10 Emission Calculations for Material Extraction (Total Over Project)
Table 3-8	Threatened and Endangered Species, Species of Special Concern, and Sensitive Species
Table 3-9	Number and Species of Birds Observed/Harassed in 2005
Table 3-10	Number and Species of Birds Killed in 2005
Table 3-11	Minimum Separation Distances from FLR-9 Antenna
Table 4-1	Past, Ongoing, and Reasonably Foreseeable Actions Used for Cumulative Effects Analysis

LIST OF APPENDICES

APPENDIX A:	Public Involvement
APPENDIX B:	North End Wetland Delineation
APPENDIX C:	Tribal Coordination
APPENDIX D:	Resource Agency Coordination

ACRONYMS AND ABBREVIATIONS

ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AFI	Air Force Instruction
AHRS	Alaska Historic Resources Survey
APET	Anchorage Port Expansion Team
AMATS	Anchorage Metropolitan Area Transportation Study
API	American Petroleum Institute
APZ	Accident Potential Zone
ARRC	Alaska Railroad Corporation
BASH	Bird Aircraft Strike Hazard
BCF	Bootlegger Cove Formation
bgs	Below ground surface
BLM	Bureau of Land Management
BMP	Best Management Practice
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CMT	Culturally modified trees
CO	Carbon monoxide
CZ	Clear Zone
dB	Decibel
dBA	A-weighted decibel
DoD	Department of Defense
EA	Environmental Assessment
EAFB	Elmendorf Air Force Base
EIS	Environmental Impact Statement
EMI	Electromagnetic interference
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FONSI	Finding of No Significant Impact
FTA	United States Department of Transportation Federal Transit Administration
FHWA	United States Department of Transportation Federal Highway Administration
ICRC	Integrated Concepts & Research Corporation
ISM	Industrial, Scientific, and Medical
Ldn	Day-Night Sound Level
Leq	Equivalent Sound Level
LF06	EAFB Landfill 06

MARAD	US Department of Transportation Maritime Administration
MBTA	Migratory Bird Treaty Act
MHz	Megahertz
MOA	Municipality of Anchorage
MSL	Mean Sea Level
MTR	Marine Terminal Redevelopment
NEPA	National Environmental Policy Act
NFA	No further action
NFS	Non-frost susceptible
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO ₂	Nitrogen dioxide
NPDES	Non-point Discharge and Elimination System
NRHP	National Register of Historic Places
NVE	Native Village of Eklutna
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
OU6	Operable Unit 6
Pb	Lead
PM-10	Particulate matter less than 10 microns
POA	Port of Anchorage
POL	Petroleum, oils, and lubricants
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SO ₂	Sulfur dioxide
SOSC	Species of Special Concern
SWPPP	Storm Water Pollution Prevention Plan
µg/L	micrograms per liter
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USAR	United States Army
USC	United States Code
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank

EXECUTIVE SUMMARY

The Port of Anchorage (POA or Port) is implementing a major expansion to support existing and projected new demands for Port services. A key component of accomplishing the goals of this expansion is the requirement of substantial amounts of imported fill to gain needed acreage. [See the Marine Terminal Redevelopment (MTR) Environmental Assessment (EA); Anchorage Port Expansion Team (APET), 2005a]. This North End Runway Material Extraction and Transport EA analyzes the potential impacts associated with material extraction activities at the North End Borrow Site and potential transportation corridors located on Elmendorf Air Force Base (EAFB), to meet a substantial portion of the fill requirements. A separate but related action proposes to meet the remaining portion of the MTR Project fill requirements by utilizing the Cherry Hill Borrow Site at EAFB for material extraction and transport. Although the Cherry Hill action and the proposed North End action would both support the MTR Project through material extraction and transport from EAFB, they are analyzed as separate actions for the following reasons:

- Either action could stand alone and have independent utility in meeting a portion of MTR project fill requirements in a timely, cost-effective manner;
- The sites are located in separate areas of EAFB, allowing for formulation and analysis of distinct alternatives to the Proposed Action for transporting material from either site to the POA;
- The North End Borrow Site would require a separate access route, even if implemented in conjunction with the Cherry Hill action;
- Independent analysis of impacts maximizes the potential for beneficial outcomes for MTR project fill material requirements and schedules; and
- At the time of the preparation of the Cherry Hill Material Extraction EA (APET, 2006), it was not clear whether and to what extent the North End Borrow Site could or would be used.

The POA, located within the Municipality of Anchorage (MOA), currently occupies approximately 120 acres. The MTR project is adding 135 acres of additional land by constructing new dock frontage and backfilling behind the new dock to the shoreline. The MTR EA (APET, 2005) was prepared for the dock expansion and a Finding of No Significant Impact (FONSI) was signed by the United States Department of Transportation (USDOT) Maritime Administration (MARAD) on March 9, 2005.

The 255-acre proposed North End Borrow Site is located approximately 4.75 miles northeast of the POA and immediately north of the North/South Runway at EAFB. It includes several borrow pits which are currently in use for construction projects within EAFB. Approximately 9.8 million bank cubic yards of recoverable material suitable for use in the MTR project are estimated to be available at the North End Borrow Site within the Proposed Action limits.

The proposed haul route comprised of unimproved roads and trails on EAFB extends generally westward from the North End Borrow Site.

Approximately 20 acres are presently cleared and are active as borrow material sources for EAFB. An additional six acres are recovering from previous borrow activities and revegetating with native species. The remaining 229 acres have not been used as a borrow source and are either cleared to keep vegetation out of the North/South Runway's approach clearance surface, or are fully vegetated.

Fill material can potentially be brought to the Port from adjacent military property or from other commercially-available sources. The 255-acre proposed North End Borrow Site has been identified as a potential source for a portion of the required fill for the MTR project at a significant cost savings and with reduced impacts over other alternatives. The cost savings are due in large part to the proximity of the North End Borrow Site to the POA.

The Proposed Action would be implemented by MARAD on EAFB property in areas where the Bureau of Land Management (BLM) has retained certain mineral rights. BLM oversees 187 acres of the 255-acre site. As such, MARAD, EAFB, and BLM have cooperated in establishing agency responsibilities. MARAD has taken the role as the lead agency, responsible for evaluating potential environmental impacts, alternatives, and preparing the North End Runway Material Extraction EA. EAFB and BLM are cooperating agencies, responsible for providing support information and reviewing this document. In addition, as owner of the mineral rights at EAFB, BLM would issue a permit to MARAD for excavation of the fill material.

Alternative 1: Excavate from the North End Borrow Site and Improve Roads for Truck Transport (Proposed Action)

MARAD proposes to expand the existing EAFB North End Borrow Site and remove approximately 9.8 million bank cubic yards of material for use in the planned Port expansion. MARAD-approved contractor(s) would be responsible for developing a Mining Plan specific to the operations and the amount of material to be used, developing and implementing all sediment and erosion control measures necessary and proper mining of the material source. The Borrow Pit Development, Operations, and Reclamation Plans will be submitted to EAFB for their approvals prior to initiating borrow operations.

Under this alternative, a haul route would be constructed that would allow transport of material by off-road trucks to the Port. Approximately 4.75 miles of existing unpaved roadway and trail between the North End Borrow Site and the POA would be improved for the purpose of fill transport.

The selected operations contractor(s) would prepare and implement, after MARAD, BLM, and EAFB approval, annual reclamation plans for each year that the site is used to support the MTR project. Each annual reclamation plan would be designed for, and consistent with, the use of the direct-access transportation route for military access from EAFB to the POA with additional improvements. The plan would incorporate drainage systems to prevent

standing water that would attract birds to the North/South Runway, while retaining adequate hydrologic systems.

For earth disturbing activities associated with the Proposed Action, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented according to United States Environmental Protection Agency (USEPA) regulations and EAFB guidance provided in EAFB's SWPPP Guidance for Construction Activities (EAFB, 2004a). The SWPPP would be submitted to EAFB for approval prior to any earth disturbing activities on site. A Notice of Intent (NOI) with USEPA would be filed and a copy of the SWPPP with the NOI will be filed with the Alaska Department of Environmental Conservation (ADEC), as required.

Period of Performance

Given the quantity of material to be removed from the North End Borrow Site, and in consideration of the MTR project schedule, it is anticipated that material excavation under this action would take up to six years to complete. The MTR project would take one year longer. Processing of materials may occur in the North End Borrow Site year-round. The activities to be performed under this action include:

- Construction necessary for pit development, to include the clearing and grubbing of trees and other vegetative matter;
- Construction necessary to improve the proposed haul route;
- Extraction and transportation of usable material;
- Stockpiling selected material on site as needed;
- Stockpiling and blending of reject material with stockpiled grubbed material;
- Distribution of blended stockpiles for reclamation;
- Final grading and seeding activities associated with pit reclamation; and
- Vegetative maintenance activities (e.g., watering and plant replacement).

Haul route improvements will include the following:

- Clearing and grubbing vegetative matter as necessary to widen existing or otherwise improve the transportation routes;
- Placing, grading, and compacting material as necessary to widen existing roads or construct new roads;
- Construction of or improvements to drainage ditches along the entire length of the haul route; and
- Construction of a crossing for haul vehicles at the intersection of 37th Street and Fairchild Avenue (also known as Loop Road).

Construction/Operations

Clearing and Grubbing

Hardwood and softwood trees, stumps, deadfall, shrubs, and the organic overburden layer to a depth of approximately two feet, would be removed. A mechanical grinder would likely be used to reduce large timber debris. To the extent feasible, organic matter would be stockpiled on site and blended with reject soil material for use in later reclamation. Timber management will be conducted under the direction of EAFB.

Industry standard equipment would be used for all clearing and grubbing activities. Clearing and grubbing activities will be phased in accordance with construction sequencing, the SWPPP, and considerations of habitat as required by state and federal law. Three brush cutters, one D7 track-type tractor, two excavators with appurtenances, one loader, and three flat-bed trucks would reasonably be expected to conduct clearing and grubbing activities.

Construct/Improve Proposed Haul Route

An unpaved haul route would be created between the North End Borrow Site and the POA. Existing roads and trails are available and would be used along most of the alignment. The haul route would incorporate 37th Street for approximately 2.0 miles, parallel Fairchild Avenue for several hundred feet, and follow existing dirt trails and 26th Street between Fairchild Avenue and the Cherry Hill Borrow Site, with final descent into POA on reconstructed, historically used ramps. The route will be adjusted to avoid adjacent wetlands to the extent practicable.

Two-way sections of road would be improved and/or widened to no more than 70 feet in width. One-way sections would be 40 feet wide. These road widths would accommodate trucks of up to 100 tons in capacity. For purposes of this North End Runway Material Extraction EA, a 100-foot wide corridor along the proposed haul route was evaluated for potential environmental impacts. The actual location of the 70-foot wide and 40-foot wide road sections will be selected within that corridor based upon engineering properties and material balances. Following completion of the Proposed Action, the improved roads would be available for EAFB use.

The haul route will require construction and active maintenance. These activities will likely include the use of front end loaders, excavators, scrapers, tractor-mounted bulldozers, motor graders, compaction equipment, water distributors, fuel trucks, concrete trucks and pumps, cranes, and dump trucks. It is anticipated that road maintenance will be performed on a continuous basis during haul operations. Three 5-cubic yard excavators, eight 40-ton off-road trucks, and one D7 track-type tractor would reasonably be expected for construction.

Material Extraction

Borrow pit operations may consist of extracting select materials for screening, washing, and/or blending operations. Processed material will be stockpiled for future loading and haul to the POA. Equipment will likely include front end loaders, excavators, tractor-mounted bulldozers, water distributors, fuel trucks, pump systems with generators, flood lights, material screening and washing plant, dump trucks, and/or scrapers. Typical borrow pit operations may include five 5-cubic yard excavators or five 5-cubic yard loaders, two 30-cubic yard scrapers, and two D7 track-type tractors. The size of the equipment will be determined by the responsible selected operations contractor(s).

Annual development, operations, and reclamation plans for the North End Borrow Site will be submitted for approval by MARAD, EAFB, and BLM prior to work. The materials will be extracted in accordance with approved plans. These site specific plans will also include provisions for encountering contaminated soils and management of hazardous materials.

Pit Reclamation/Revegetation

Areas and excavated earth materials not used in or maintained for future construction will be graded to drain and stabilized in accordance with approved annual reclamation plans for the borrow pit. Permanent stabilization of the final graded surface will predominantly consist of a vegetative cover. This will be accomplished by plantings or cuttings, or other method approved by EAFB. The vegetative cover is intended to mitigate future risks associated with Bird Aircraft Strike Hazard (BASH). Overburden recovered from pit development will be incorporated into site reclamation to encourage regrowth and regeneration of naturally occurring woody plants and other native species. Areas and excavated materials maintained for future construction will be temporarily stabilized as needed. These plans for reclamation will be approved by MARAD, EAFB, BLM, and the Alaska Department of Natural Resources (ADNR) as appropriate as well as comply with state and federal requirements.

Due to the nature and complexity of excavating from the North End Borrow Site, and uncertainties regarding future use of the area by EAFB, a complete reclamation plan is not feasible at this time. Therefore, an annual reclamation plan will be prepared for each year of use. EAFB will confirm consistency with the anticipated land use plan for the area at the time of submittal.

Alternative 2: Excavate and Conduct Minimal Road Improvements

This alternative involves excavating fill material from the North End Borrow Site, similar to the Proposed Action, but only includes minimal improvements to the existing roadways. Using a haul route with minimal improvements will dictate use of smaller-capacity trucks making more trips than Alternative 1. Soil handling methods and reclamation activities would occur as stated in Alternative 1. The route would incorporate 37th Street for approximately 2.0 miles, parallel Fairchild Avenue for several hundred feet, and follow existing dirt trails and 26th Street between Fairchild Avenue and the

Cherry Hill Borrow Site, with final descent into POA on reconstructed, historically used ramps.

Alternative 3: “No-Action”

The “No-Action” Alternative would entail using only fill from other sources to provide for Port expansion activities. Under this alternative, all imported material would be purchased competitively from commercial providers, non-commercial providers, or a combination of these. The actual sources and transportation routes would be determined by selected operations contractor(s) competitively selected for specific phases of the MTR project, and likely would entail use of non-federally funded, owned or operated sites which may or may not be subject to National Environmental Policy Act (NEPA) compliance.

Material under this alternative would be transported by public road, commercial rail, and/or barge traveling over public waters. For comparison purposes, one train with 80 cars carrying 100 tons of material in each car could transport 8,000 tons of fill. Ten 25-ton trucks bringing in material every hour could transport 4,000 tons of fill per 16-hour day (160 truck-trips). A single barge could transport approximately 6,750 tons of material per trip.

Affected Environment and Environmental Consequences

Complete analyses of all resource categories are provided in the body of this North End Runway Material Extraction EA. A summary assessment of the potential environmental impacts on physical, natural, and human resources from the Proposed Action is presented in Table ES-1. Impacts from Alternatives 1 and 2 were less than significant, in part, because a portion of the area has been intermittently used as a source of materials for previous EAFB construction projects. Approximately 12 acres of wetlands dispersed throughout the site and associated habitat will be removed through this action, resulting in an adverse effect. However, the removal is beneficial to EAFB, since the wetlands create a bird air strike hazard at the end of their most active runway. Mitigation would occur to avoid, reduce, or compensate for adverse impacts to wetlands, likely through compensatory or offsite mitigation. Procedures regarding the wetland loss will be addressed in the following documents: United States Air Force (USAF) Finding of No Practicable Alternative (FONPA), Executive Order (EO) 11990, and United States Army Corps of Engineers (USACE) wetland permit. Alternative 3, the “No-Action” Alternative, would result in all required fill materials being obtained from off-site commercial or non-commercial sources and transported to the MTR project from public transportation routes. Potential impacts from those activities are addressed in the MTR EA (APET, 2005).

Table ES-1
Summary of Potential Impacts by Resource Category

Resource Category	Alternative 1	Alternative 2	Alternative 3
	Excavate at North End and Improve Roads for Truck Transport (Proposed Action)	Excavate and Conduct Minimal Road Improvements	"No-Action"
<i>Physical Resources</i>			
Air Quality	<ul style="list-style-type: none"> No significant impacts to air quality. Total emissions generated by extraction, screening and transport of 9.8 million bank cubic yards of fill are estimated at 491 tons of carbon monoxide (CO) and 245 tons of particulate matter (PM-10). Similar emissions have occurred, at least intermittently and on a more limited basis, from use of the area as a material source for EAFB construction projects over the last ten years. 	<ul style="list-style-type: none"> CO emissions are calculated to exceed the 100 ton/year <i>de minimus</i> level. Total emissions generated by extraction, screening and transport of 9.8 million bank cubic yards along existing roads are estimated at 677 tons of carbon monoxide and 296 tons of particulate matter. 	<ul style="list-style-type: none"> Transportation distances and degree of public road use depends upon location of extraction sites.*
Noise	<ul style="list-style-type: none"> No significant noise impacts would occur. Noise levels would increase during construction and transport operations. Minimal impacts to nearest sensitive receptor to transportation corridor (45 dBA). Distance and vegetation attenuation would reduce cumulative noise as a result of background noise and Proposed Action activities at aviation operation support buildings, approximately 1,000 feet away to 34 dBA. Similar noise levels have occurred, at least intermittently, from use of a portion of the area as a material source for EAFB construction projects in the past. 	<ul style="list-style-type: none"> No significant noise impacts would occur. Instead, impacts would be similar to those from Alternative 1. Excavation operations would have the same impacts as Alternative 1. Minimal impacts to nearest sensitive receptor to transportation corridor (38 dBA). Distance attenuation would reduce cumulative noise as a result of background noise and Alternative 2 activities aviation operation support buildings, approximately 1,000 feet away to 34 dBA. 	<ul style="list-style-type: none"> No impacts to noise at EAFB. Transport of material along public roads and/or railway would cause increased noise and vibration.* Underwater noise can be produced by operation of vessels if barges are used.*

* See MTR Project EA (APET, 2005)

Resource Category	Alternative 1	Alternative 2	Alternative 3
	Excavate at North End and Improve Roads for Truck Transport (Proposed Action)	Excavate and Conduct Minimal Road Improvements	"No-Action"
Hazardous Materials and Waste	<ul style="list-style-type: none"> • Less than significant, adverse hazardous materials and waste impacts would occur. • Annual development, operations, and reclamation plans will be required prior to initiating excavation activities to address site specific potential for discovery and management. 	<ul style="list-style-type: none"> • Less than significant, adverse impacts would be expected during excavation activities and transportation operations on existing EAFB roads. • Annual development, operations, and reclamation plans will be required prior to initiating excavation activities to address site specific potential for discovery and management. 	<ul style="list-style-type: none"> • No significant adverse hazardous materials and waste impacts would occur.
Visual Resources	<ul style="list-style-type: none"> • Visual resource impacts would be limited to the life of operations, and would not be significant. • Portions of the site would be visible to overhead aircraft. • Annually, recontouring and revegetation would be implemented. • A vegetative buffer along the roadway would remain. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • No impacts would occur to visual resources at the North End Borrow Site.
<i>Natural Resources</i>			
Geology and Soils	<ul style="list-style-type: none"> • No significant impacts to geology and soils. • Potentially reduced availability of fill for future use on EAFB projects. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • No significant impacts to geology of the North End Borrow Site. Reduced availability of fill for future use on other commercial projects from existing or new commercial material sources.*

* See MTR Project EA (APET, 2005)

Resource Category	Alternative 1	Alternative 2	Alternative 3
	Excavate at North End and Improve Roads for Truck Transport (Proposed Action)	Excavate and Conduct Minimal Road Improvements	"No-Action"
Ground Water	<ul style="list-style-type: none"> • No significant impacts to ground water. • Mining activities could expose perched water lenses, although excavating through them would not impact ground water flow. • Will follow USEPA regulations and EAFB SWPPP guidance. Contaminated material will be set aside and managed per EAFB recommendations. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • Potential impacts to ground water depend upon source location.*
Vegetation	<ul style="list-style-type: none"> • Less than significant impacts to vegetation. • Short-term (one to three years) reduction in vegetative cover would occur. • Vegetation resources in portions of the area are already impacted by borrow pit activity and runway approach zone clearing. Some newly disturbed acreage would be impacted; however, both annual and long-term reclamation plans would be implemented. • Road widening on 37th Street and new road construction would create less than significant impacts to vegetation along the alignment, as a reclamation plan would be implemented. 	<ul style="list-style-type: none"> • Excavation effects are the same as Alternative 1. • Transportation effects have no significant impacts to vegetation due to the limited amount of required road widening. 	<ul style="list-style-type: none"> • No significant adverse impacts to vegetation at the North End Borrow Site. • No reclamation plan would be implemented. • Potential vegetation impacts depend upon the selected source(s) and transportation method.*

* See MTR Project EA (APET, 2005)

Resource Category	Alternative 1	Alternative 2	Alternative 3
	Excavate at North End and Improve Roads for Truck Transport (Proposed Action)	Excavate and Conduct Minimal Road Improvements	"No-Action"
Wildlife	<ul style="list-style-type: none"> No significant impacts to localized wildlife populations. Vegetative habitat would be temporarily removed. Removal of 12 acres of wetlands would result in loss of associated habitat, yet decrease the number of birds taken each year by EAFB for safety reasons. Adverse impact from loss of wetland habitat to be reduced through mitigation. Wildlife resources in the area are partially impacted by previous and current EAFB projects. Some habitat areas would be newly disturbed. However, a reclamation plan including requirements for revegetation and monitoring, would be implemented per MARAD, EAFB and BLM approval. 	<ul style="list-style-type: none"> Same as Alternative 1. 	<ul style="list-style-type: none"> No significant impacts to wildlife at the North End Borrow Site. Potential wildlife impacts depend upon the selected source(s) and transportation method.*
Threatened and Endangered Species	<ul style="list-style-type: none"> No significant impacts to threatened and endangered species, since none are known to be present in the North End Borrow Site. No significant impacts to migrant bird Species of Special Concern (SOSC) or sensitive species due to expeditious reclamation of disturbed areas and the presence of similar and higher value habitats nearby. 	<ul style="list-style-type: none"> Same as Alternative 1. 	<ul style="list-style-type: none"> No significant impacts to threatened and endangered species at the North End Borrow Site. No new environmental consequences are expected for threatened and endangered species using this alternative. However, actual impacts would depend upon the source site(s) and transportation method selected. Beluga whales, a candidate species, would be exposed to noise and disturbance if barges were used. Belugas appear to be tolerant to frequent passages by larger ships.*

* See MTR Project EA (APET, 2005)

Resource Category	Alternative 1	Alternative 2	Alternative 3
	Excavate at North End and Improve Roads for Truck Transport (Proposed Action)	Excavate and Conduct Minimal Road Improvements	"No-Action"
Surface Water	<ul style="list-style-type: none"> • Adverse, but not significant, impacts to surface water. • Newly exposed sediment would likely become entrained in surface water runoff. BMPs and SWPPP in place for minimal impacts. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • No significant adverse impacts to surface water at the North End Borrow Site.
Wetland Resources	<ul style="list-style-type: none"> • Adverse, but not significant, impacts would occur due to removal of approximately 12 acres of wetlands. • Impacts from removal of 12 acres of wetlands to be reduced through mitigation. • Aircraft safety hazard due to proximity of bird-attracting wetlands to EAFB runway would be eliminated, resulting in beneficial impacts to EAFB operations. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • No significant impacts to wetland resources, as there would be no excavation in the North End Borrow Site. • Potential impacts to wetland resources depend upon the selected source(s).* • EAFB could potentially remove or substantially modify the wetlands under the Bird Aircraft Strike Hazard (BASH) program, resulting in potential for adverse impacts to wetlands. • No beneficial effects to EAFB operations from removal of bird strike hazards.
Other Resources	<ul style="list-style-type: none"> • Prime or Unique Farmlands, Floodplains, or Wilderness Areas are not present at the North End Borrow Site. No impacts would occur. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • Potential impacts to Prime or Unique Farmlands, Floodplains, or Wilderness Areas depend upon the selected source(s).
<i>Human Resources</i>			
Cultural and Historic Resources	<ul style="list-style-type: none"> • No significant impacts to cultural or historic resources. • A Cultural Resources Monitoring Plan would be submitted to MARAD, EAFB, and BLM for approval prior to excavation and would be implemented during operations. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • No significant impacts to cultural resources at the North End Borrow Site. • Potential impacts to cultural and historic resources depend upon the selected source(s).

* See MTR Project EA (APET, 2005)

Resource Category	Alternative 1	Alternative 2	Alternative 3
	Excavate at North End and Improve Roads for Truck Transport (Proposed Action)	Excavate and Conduct Minimal Road Improvements	"No-Action"
Socio-economics	<ul style="list-style-type: none"> • Beneficial impacts to economy. • Aircraft equipment and personnel safety would be improved by removing standing water which is a waterfowl attractant. • Removal of a hill north of the North/South Runway would increase aircraft takeoff and landing safety. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • Benefits would be similar to Alternative 1 except that aircraft safety would not be improved and the hill would not be removed.
Environmental Justice	<ul style="list-style-type: none"> • No significant impacts to environmental justice. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • Impacts to environmental justice depend upon the selected source(s) and transportation method.*
Land Use and Recreation	<ul style="list-style-type: none"> • No significant impacts to land use. • Minor impacts to recreation. • Trails and access to lakes would be temporarily limited. • Recreation features would be replaced, if consistent with long-term EAFB land use plans, as part of the reclamation program. 	<ul style="list-style-type: none"> • Same as Alternative 1. 	<ul style="list-style-type: none"> • No significant impacts to land use or recreation at the North End Borrow Site. • Access to trails and lakes at the North End Borrow Site would not be limited because excavation would occur elsewhere. • Impacts to land use and recreation would depend upon the area(s) selected for borrow material.

* See MTR Project EA (APET, 2005)

1.0 PURPOSE AND NEED

The Port of Anchorage (POA or Port) is currently operating above its sustainable practicable capacity and has embarked on a major expansion in order to better serve the needs of Anchorage and Alaska. Expansion at the POA is part of a Marine Terminal Redevelopment (MTR) project that will occur over the next seven years and will require multiple phases of construction; fill is required over the next six years [See the MTR Environmental Assessment (EA); Anchorage Port Expansion Team (APET), 2005a]. Substantial amounts of imported fill are needed to gain acreage for the expansion, making fill material a key component of accomplishing the MTR goals.

This North End Runway Material Extraction EA analyzes the potential impacts associated with extracting fill material from what is referred to here as the North End Borrow Site, and transporting it to the POA. The North End Runway Material Extraction EA is prepared by the United States Department of Transportation (USDOT) Maritime Administration (MARAD), the lead federal agency for this action.

In a separate but related action, the Cherry Hill Material Extraction EA (APET, 2006) analyzes potential impacts associated with extracting fill material from the Cherry Hill Borrow Site at Elmendorf Air Force Base (EAFB), and transporting it to the POA. The 97-acre proposed Cherry Hill site contains approximately 3.3 million cubic yards of recoverable material and is located southwest of the North End Borrow Site, on a bluff adjacent to the northern terminus of the POA. Although the Cherry Hill action and the proposed North End action would both support the MTR Project through material extraction and transport from EAFB, they are analyzed as separate actions for the following reasons:

- Either action could stand alone and have independent utility in meeting a portion of MTR project fill requirements in a timely, cost-effective manner;
- The sites are located in separate areas of EAFB, allowing for formulation and analysis of distinct alternatives to the proposed action for transporting material from either site to the POA;
- The North End Borrow Site would require a separate access route, even if implemented in conjunction with the Cherry Hill action;
- Independent analysis of impacts maximizes the potential for beneficial outcomes for MTR project fill material requirements and schedules; and
- At the time of the preparation of the Cherry Hill Material Extraction EA (APET, 2006), it was not clear whether and to what extent the North End Borrow Site could or would be used.

1.1 LOCATION AND DESCRIPTION

The North End Borrow Site is located immediately north of the EAFB North/South Runway and approximately 4.75 miles northeast of the Port. EAFB is located in

Southcentral Alaska (Figure 1). The installation is bordered on the east by Fort Richardson Army Base; on the north and east by the Knik Arm of Cook Inlet; and on the south by the Port, the Anchorage Railroad Corporation (ARRC), private industry, and residential districts of Anchorage.

The North End Borrow Site area encompasses approximately 255 acres of land within the Seward Meridian, Township 14 North, Range 3 West, Sections 27, 28, 33, and 34 (Figure 2). A portion of the North End Borrow Site has been intermittently used as a material source for EAFB construction projects over the last ten years. Approximately 20 acres are currently cleared and are active as borrow material sites. An additional six acres are recovering from previous borrow activities and revegetating with native species. The remaining 258 acres have not been used as a borrow source and are either cleared to keep vegetation out of the runway's approach clearance surface or are fully vegetated. The overall site has a topographic relief of 110 feet (Terracon, 2005a).

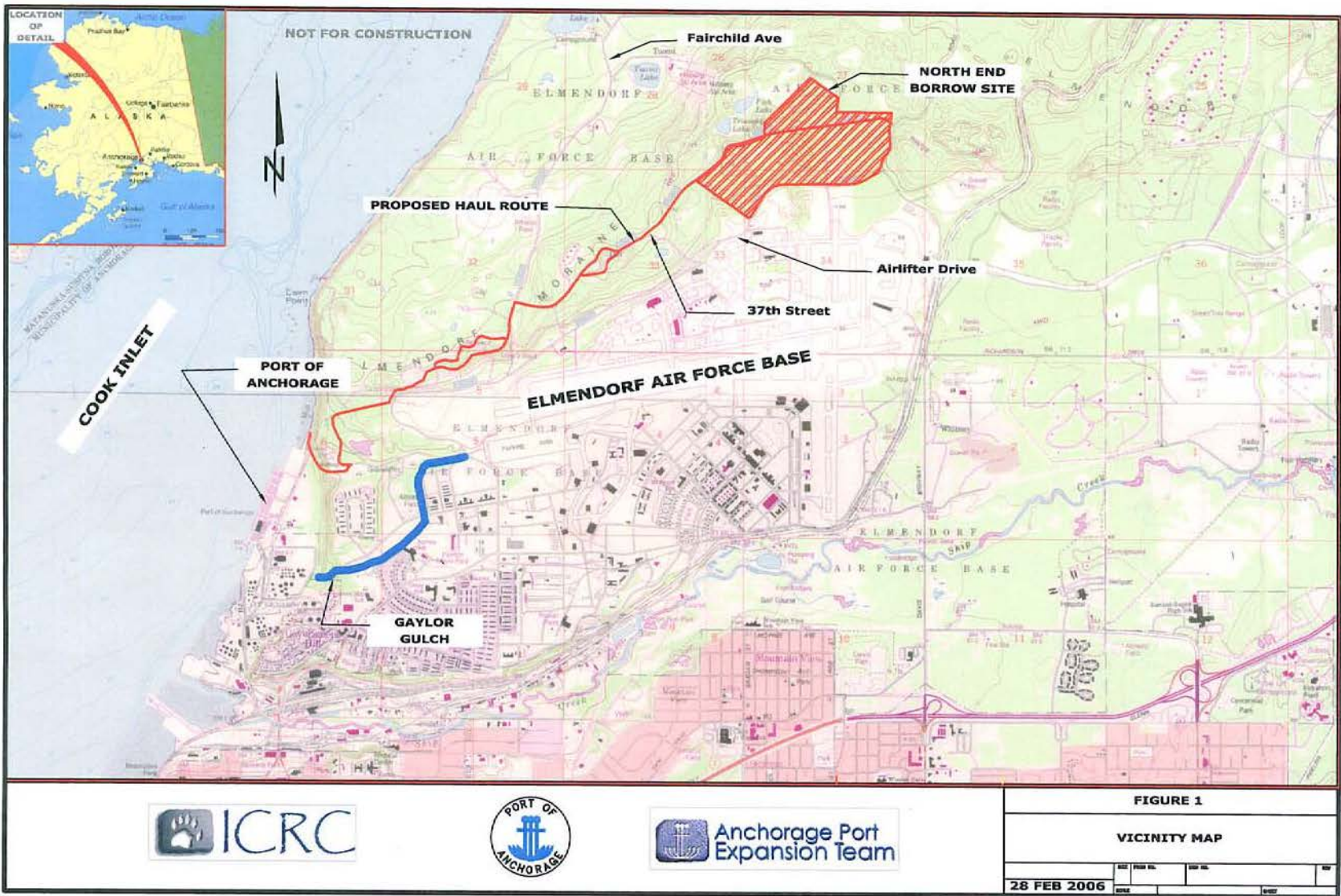
Portions of the North End Borrow Site have been historically used as a material source for construction projects within EAFB. Except where the area has already been mined, topsoil covers 1 to 12 inches. A series of borings were drilled in 2004 to verify the presence and depth of usable fill material in the southern portion of the proposed borrow site. More borings are scheduled to be drilled in the northern portion of the proposed borrow site in 2005 to determine the quantity of usable material at that location.

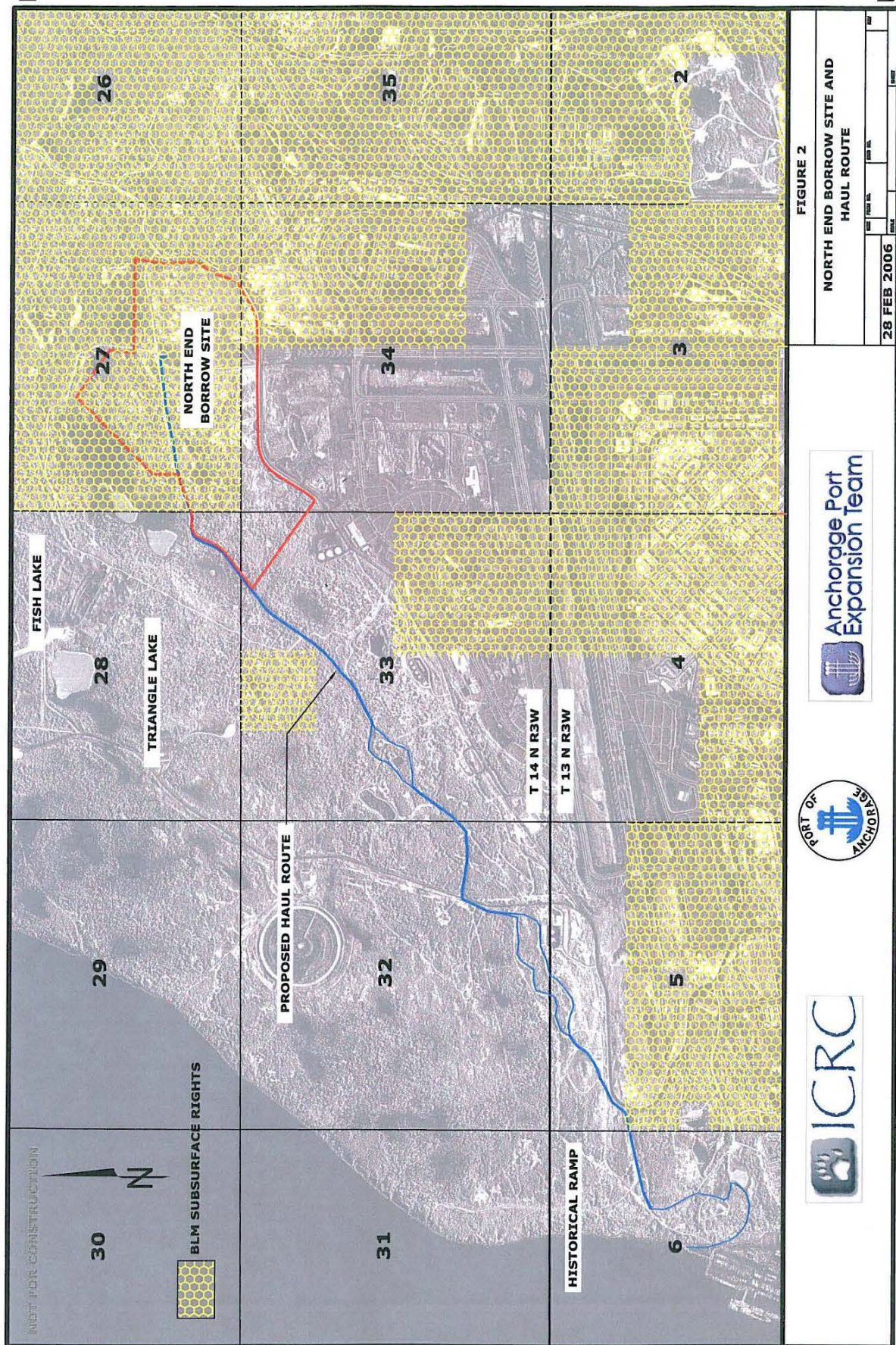
Of the proposed 255-acre borrow site, the Bureau of Land Management (BLM) manages the vegetation on the areas shown in Figure 2. Per Executive Order (EO) 8102, land within BLM-managed boundaries is under a withdrawal for a military reservation. BLM's role is to manage the vegetative and mineral resources if put to non-military uses. BLM would issue an authorization for a non-military use within this withdrawal with the concurrence of the military. The transportation corridor does not have any BLM oversight.

1.2 ACTION PURPOSE AND NEED

The purpose of this action is to provide an economically viable source of fill material with minimal impacts for the MTR project, while reducing the surface elevation of a hill which is a safety hazard for users of the North/South Runway.

The approach clearance surface at a military airport is defined as an inclined plane, beginning 200 feet beyond each end of the primary surface of the runway and extending for 50,000 feet (40 CFR 77.28). The slope of the approach clearance surface is 50 horizontal to 1 vertical along the runway centerline, extended until it reaches an elevation of 500 feet above the established airport elevation. Any object greater in height than this surface is an obstruction to air navigation (40 CFR 23.23). To reduce the occurrence and likelihood of intrusion into navigable air space, EAFB management has identified the need to lower the surface elevation of a hill at the north end of the North/South Runway. That hill is located within the North End Borrow Site.





The MTR EA proposes adding 135 acres of additional land by constructing 8,800 feet of dock frontage, approximately 400 feet westward of the existing dock face, and backfilling behind the new dock to the shoreline. An EA was prepared as a separate action for the dock expansion work and a Finding of No Significant Impact (FONSI) was signed by MARAD on March 9, 2005. Thus, this North End Runway Material Extraction EA assesses impacts specifically from mining the North End Borrow Site and proposed haul route, and only considers the MTR impacts on a cumulative basis. The Proposed Action can stand alone in providing material and is not dependant upon any other action.

Approximately 12.3 million cubic yards of suitable engineered and common fill material will be needed for the MTR project. This volume of material cannot feasibly be provided from a single nearby existing or developable commercial or non-commercial site. Instead, the material will come from multiple commercial and non-commercial sources. The feasibility of using a specific source, including the North End Borrow Site, to provide a portion of the required MTR project material is dependent upon a number of factors. Those factors, which define the purpose and need, are:

- ***Sufficient Quantity.*** To meet the defined purpose, approximately 12.3 million cubic yards of suitable engineered and common fill material will be needed for the MTR project. The required volume will need to be provided over a six year construction period for fill. Although it is recognized that no single site will likely provide all the required material, it is important that each site provide sufficient quantity to make planning, characterization, tracking, and logistics development practicable. Thus, any utilized site needs to have the capacity to provide at least ten percent of the required total material volume.
- ***Sufficient Quality.*** Given the design approach for the MTR project, it is critical that the material comply with engineering specifications selected to provide adequate stability for site conditions, including seismic conditions. It is also critical that the material will de-water and compact in a time period compatible with the proposed construction schedule. The material specifications have been divided into two categories: “common fill” that can be used in the fill areas remote from the dock face, and “engineered fill” that will be used in proximity to the dock face. Thus, any site needs to have materials that meet one or both of the specified fill categories in sufficient volume.
- ***Availability and Capacity.*** The demand for material for the MTR project will substantially increase the demand from commercial material sources in the region. Other major construction programs also will continue in the region at the same time. Therefore, commercial sources with existing clients may not have the availability and capacity to meet a demand significantly greater than that created by their current customers. Thus, any commercial site needs to be able to commit to providing substantial volumes of either or both specific material types.
- ***Transportation Distance.*** The distance over which material has to be transported is significant for several reasons including:

- **Cost.** A significant portion of the cost associated with fill material is the cost of transportation. Logically, the greater the distance transported, the greater the cost.
- **Other Effects.** Transportation of material creates potential effects such as increased noise, air emissions, and traffic congestion. Logically, the greater the distance material is transported, the greater the potential effects.

Sites providing material need to be sufficiently close to the POA to make transportation of materials feasible and practicable.

- **Transportation Access.** There are basically three transportation options for transporting required material to the POA. They are:
 - Transportation by truck;
 - Transportation by rail; and
 - Transportation by barge.

Sites providing material to the MTR project will require access to one or more of these transportation methods. The ability to transport by truck is limited by traffic congestion that would occur, both on public roads, especially near the entrance to the Port, and within the POA. The EA for the MTR project (APET, 2005) notes a limit to truck transport of material into the Port security gate from public road of 36,000 tons per year to mitigate traffic congestion, and associated air quality and noise impacts. Access by truck from adjacent military property is not subject to the same limitation. Rail transport is limited by track capacity and the number of other trains scheduled during the construction season. Barge transport is constrained by the requirement to protect shipping lanes at the POA.

Given these factors, the North End Borrow Site addresses the defined purpose and need of this action.

- The North End Borrow Site can provide as much as 9.8 million cubic yards, or approximately 80 percent of the required MTR project materials (Terracon, 2005b).
- The material available at the North End Borrow Site meets the required engineering specifications (Terracon, 2005b).
- The site is not presently used for commercial purposes; however, a portion of the site has been intermittently used to provide construction material for EAFB projects. MARAD and EAFB have entered into an agreement to confirm the availability of the material for the MTR project. Thus, there is sufficient availability and capacity.

- The North End Borrow Site is in proximity to the POA. Maximum transportation distances will be approximately 4.75 miles to the POA and is substantially closer to the MTR project than any known potential commercial source.
- Since EAFB abuts POA property, material can be transported directly to the MTR project site without the use of public roads or commercial rail line.

There are additional benefits to using the North End Borrow Site. Extracting as much as 80 percent of the required MTR project fill material from the North End Borrow Site would be mutually beneficial for EAFB, the United States Department of Defense (DoD), and MARAD. In addition, excavation will involve removing a hill at the end of the runway resulting in a safer takeoff and landing zone for EAFB and the DoD. Using the North End Borrow Site could also support future military access to a secured waterfront loading and offloading facility with the proposed haul route and would also result in ultimate reclamation of the existing borrow pit areas. For MARAD, using the North End Borrow Site for source fill material would result in a significant savings to the taxpayer. Because of its proximity to the MTR project, use of the North End Borrow Site would reduce the impacts of transporting all required fill from more distant sources.

1.3 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) APPROACH

Pursuant to NEPA, the potential impact to the environment as a result of this federal action is being evaluated prior to making the decision on whether to implement the action. The spirit of NEPA requires that all federal actions be analyzed for potential impact to the environment. The intent of this North End Runway Material Extraction EA is to provide sufficient evidence and analysis for determining whether there is potential for significant impact from this action, thus requiring an Environmental Impact Statement (EIS), or whether there is justification to prepare a FONSI.

The Proposed Action would be implemented by MARAD on EAFB property in areas where BLM has retained certain mineral rights. As such, MARAD, EAFB, and BLM have cooperated in establishing agency responsibilities. MARAD has taken the role as the lead agency, responsible for evaluating potential environmental impacts, alternatives, and preparing the North End Runway Material Extraction EA. EAFB and BLM are cooperating agencies, responsible for providing support information and reviewing the North End Runway Material Extraction EA.

A separate but related action proposes to meet another portion of the MTR fill requirement by utilizing the Cherry Hill Borrow Site at EAFB. Although the Cherry Hill action and the proposed North End action would both support the MTR project through material extraction and transport from EAFB, they are analyzed as separate actions for reasons stated in the Executive Summary, page 1. Cumulative impacts incorporating both of these projects are discussed in Section 4.0, Cumulative Effects.

As noted, this action is being considered to address material needs for the MTR project. A separate EA has been prepared by MARAD for the MTR project (APET, 2005), and a

FONSI was issued by MARAD. Thus, this North End Runway Material Extraction EA assesses impacts specifically related to use of material from the North End Borrow Site, and does not assess other MTR project impacts, except on a cumulative basis.

This North End Runway Material Extraction EA was prepared in accordance with criteria established in the following governing laws and regulations:

- NEPA;
- 40 CFR 1500-1508, Environmental Protection, Regulations for Implementing the Procedural Provisions of NEPA;
- 32 CFR 989, Environmental Impact Analysis Process for Department of the Air Force Installations;
- Maritime Administrative Order 600-1, MARAD Procedures for Considering Environmental Impacts;
- Department of Transportation Office of the Secretary, Order DOT 5610.1c, Procedures for Considering Environmental Impacts; and
- EO 8102.

NEPA requires the decision making process to include public involvement. As such, a notice will be published by MARAD announcing the availability of this Draft North End Runway Material Extraction EA for public review. Comments will be addressed and included in the Final North End Runway Material Extraction EA, Appendix A.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 ALTERNATIVES IDENTIFICATION PROCESS

For Proposed Actions that require preparation of an EA, Council on Environmental Quality regulations [40 CFR 1508.9(b)] and NEPA Section 102(2)(E) require that appropriate alternatives to the Proposed Action be studied, developed, and described. The “No-Action” Alternative must be included. Alternatives eliminated from detailed study should be identified, along with the reasons for their elimination.

The following constraints were used for determining if sites meet the alternative selection criteria.

- The site, or combination of sites, must allow for economically feasible excavation and transportation costs.
- The site, or combination of sites, must have an adequate volume of suitable fill to justify the fixed costs associated with developing and using the source.
- In determining the feasibility of obtaining fill material for POA expansion, specific engineering specification for material type and strength must be considered.
 - Material for common fill would be a mixture of sand and gravel with at least 85 percent by weight smaller than four inches in particle size, 15 to 50 percent by weight passing a No. 200 sieve, and a maximum particle size of 12 inches. Up to 5.3 million cubic yards of common fill will be needed.
 - Material for engineered fill would be a mixture of sand and gravel with at least 85 percent by weight smaller than four inches in particle size, no more than 15 percent by weight passing a No. 200 sieve, and a maximum particle size of 12 inches. Roughly 6.0 million cubic yards of engineered fill material will be needed.
 - Material placed for the non-frost susceptible (NFS) zone would be a mixture of sand and gravel with at least 85 percent by weight smaller than three inches in particle size, no more than 6 percent by weight passing a No. 200 sieve, and a maximum particle size of 6 inches. Approximately 1.0 million cubic yards of NFS fill will be needed.

Using these criteria, in conjunction with the desire of EAFB to have the hill at the north end of the North/South Runway removed, two action alternatives were identified as potential options to be carried forward for use of fill material from the North End Borrow Site: 1) excavate fill material from the north end of the North/South Runway and construct/improve direct access to the POA for fill transport, and 2) excavate fill material from the north end of the North/South Runway and transport the fill to the POA by

existing unimproved roadways. Additionally, the “No-Action” Alternative of not excavating material from the north end of the North/South Runway and, instead, acquiring all fill from other commercially-available sources is evaluated. These alternatives are described below in Section 2.2.

No other feasible alternatives for the utilization of North End Borrow Site material are available. Additional alternatives for fill material, other than use of the North End Borrow Site and use of other commercial and non-commercial fill sources, were considered, but were not carried forward, because of their failure to meet the purpose and need of the action. Those alternatives included:

- **Use of Dredged Material.** The option entails the use of materials excavated by the United States Army Corps of Engineers (USACE) during on-going maintenance dredging at the POA as fill for the MTR project. Available dredged material consists of fine-grained, relatively cohesive materials that drain poorly, and provide insufficient strength for MTR project engineering requirements. Therefore, this alternative does not meet the Proposed Action selection criteria and was not advanced.
- **Use of Artificial, Light-Weight Fill.** This option entails use of manufactured, light-weight fill that provides substantially improved strength properties for the given weight of material over natural construction materials. However, engineering analyses determined that readily available native sands and gravels, such as the material at EAFB provide adequate strength, and that there was not a need for higher strength materials. In addition, engineering estimates indicate that the cost of artificial fill is significantly greater than natural construction materials, rendering its use cost-ineffective. Due to its failure to meet the cost-effective selection criterion, this alternative was not advanced.
- **Use of Material from the Cherry Hill Borrow Site.** This option entails excavating 3.3 million cubic yards of recoverable material suitable for use in the MTR project. This alternative is attractive for several reasons and is currently being evaluated as part of a separate EA (APET, 2006). Adequate volume and quality of fill material at the Cherry Hill Borrow Site is not available beyond the 3.3 million cubic yards being evaluated separately, and is; therefore, not advanced for additional analysis here.
- **North End Borrow Site Excavation with Transport to POA by Rail.** This option involves excavating the same area as the Proposed Action, but transporting it to the Port using the main-line track that goes through EAFB. Complications involving use of the existing rail track include: 1) truck transport would still be required to haul material from the North End Borrow Site to the rail cars; 2) the existing rail contains only a single track which is used for passenger and other cargo transport; and 3) there is no capability to offload fill material at the Port until the third track is completed in 2011. Since it is not economically feasible or practical to address and correct these issues, this alternative was not advanced for analysis.

2.2 ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS

2.2.1 Alternative 1: Excavate from the North End Borrow Site and Improve Roads for Truck Transport (Proposed Action)

MARAD proposes to expand the existing North End Borrow Site to 255 acres and excavate 9.8 million cubic yards of material for use in the planned MTR project. Exploration through soil borings drilled during 2004 indicate that as much as 2.7 million cubic yards of engineered fill and 3.0 million cubic yards of common fill are available within the 190 acres explored in the south portion of the Proposed Action. Material from the southern portion alone would be adequate to meet the volume selection criterion for economic feasibility. The remainder of the required fill material for the MTR project would be obtained from other sources.

Clearing and Grubbing

Hardwood and softwood trees, stumps, deadfall, shrubs, and the organic overburden layer to a depth of approximately two feet, would be removed. A mechanical grinder would likely be used to reduce large timber debris. To the extent feasible, organic matter would be stockpiled on site and blended with reject soil material for use in later reclamation. Timber management will be conducted under the direction of EAFB. Vegetation, including timber, on areas under the jurisdiction of BLM will be managed by BLM or by agreement between BLM and EAFB.

Industry standard equipment may be used for all clearing and grubbing activities. Clearing and grubbing activities will be phased in accordance with construction sequencing, the Storm Water Pollution Prevention Plan (SWPPP), and considerations of habitat as required by state and federal law. Three brush cutters, one D7 track-type tractor, two excavators with appurtenances, one loader, and three flat-bed trucks would reasonably be expected to conduct clearing and grubbing activities.

Construct/Improve Proposed Haul Route

Existing roadways and trails between the proposed North End Borrow Site and POA would be improved. An unpaved haul route (refer to Figure 2) would be created between the North End Borrow Site and the POA for the purpose of transporting fill material by truck to the Port. An estimated 26 acres of land could be disturbed as part of the road improvements. Existing roads and trails are available and would be used along most of the alignment. The route would incorporate 37th Street for approximately 2.0 miles, parallel Fairchild Avenue for several hundred feet, and follow existing dirt trails and 26th Street between Fairchild Avenue and the Cherry Hill Borrow Site, with final descent into POA on reconstructed, historically used ramps. The route will be adjusted to avoid adjacent wetlands to the extent practicable.

The haul route would cross the EAFB north jet fuel pipeline at two locations; once near the Port and once near Airlifter Drive. The location and depth of the pipeline would be verified in the field prior to construction. Sufficient earth cover to protect the pipeline, as

calculated per API 1102, *Steel Pipelines Crossing Railroads and Highways*, would be incorporated in the road design.

A crossing to maintain continuous traffic flow at the intersection would be constructed for the haul route to cross Fairchild Avenue. This would likely entail creating a sub-grade crossing where Fairchild would be raised above its existing elevation. Traffic on Fairchild Avenue would be temporarily diverted while the crossing is constructed. The crossing would be either left in place or removed at the end of the project, depending on EAFB needs.

Portions of the EAFB storm water system may be rerouted by EAFB from the existing system to discharge north of Gaylor Gulch (See Figure 1). The haul route alignment associated with the Proposed Action creates a grade from EAFB to a potential discharge point into the upper Cook Inlet. This grade and alignment corridor accommodates a future open ditch or underground pipe system that could discharge into downstream controls and diminish discharge into Gaylor Gulch. Construction of a new EAFB drainage discharge system would likely occur after the Proposed Action.

Two-way sections of road would be improved and/or widened to no more than 70 feet in width. One-way sections would be 40 feet wide. These road widths would accommodate trucks of up to 100 tons in capacity. For purposes of this North End Runway Material Extraction EA, a 100-foot wide corridor along the proposed haul route was evaluated for potential environmental impacts. The actual location of the 70-foot wide and 40-foot wide road sections will be selected within that corridor based upon engineering properties and material balances. Following completion of the Proposed Action, the improved roads would be available for EAFB use.

The haul route will require construction and active maintenance. These activities will likely include the use of front end loaders, excavators, scrapers, tractor-mounted bulldozers, motor graders, compaction equipment, water distributors, fuel trucks, concrete trucks and pumps, cranes, and dump trucks. It is anticipated that road maintenance will be performed on a continuous basis during haul operations. Three 5-cubic yard excavators, eight 40-ton off-road trucks, and one D7 track-type tractor would reasonably be expected for construction.

Once improvements are completed, the haul route would have grades capable of accommodating vehicles and heavy equipment. For purposes of this North End Runway Material Extraction EA, a 100-foot wide corridor along the proposed route was evaluated for potential environmental impact. The actual location of the 70-foot wide and 40-foot wide road sections will be selected within that corridor based upon engineering properties and material balances. The selected operations contractor(s) would be required to provide provisions for accommodating ground water, storm water pollution prevention, and reclamation. Following completion of the Proposed Action, the improved roads would be available for EAFB use.

Material Extraction

Borrow pit operations may consist of extracting select materials for screening, washing, and/or blending operations. Processed material will be stockpiled for future loading and haul to the POA. Equipment will likely include front end loaders, excavators, tractor-mounted bulldozers, water distributors, fuel trucks, pump systems with generators, flood lights, material screening and washing plant, dump trucks, and/or scrapers. Typical borrow pit operations may include five 5-cubic yard excavators or five 5-cubic yard loaders, two 30-cubic yard scrapers, and two D7 track-type tractors. The size of the equipment will be determined by the responsible selected operations contractor(s).

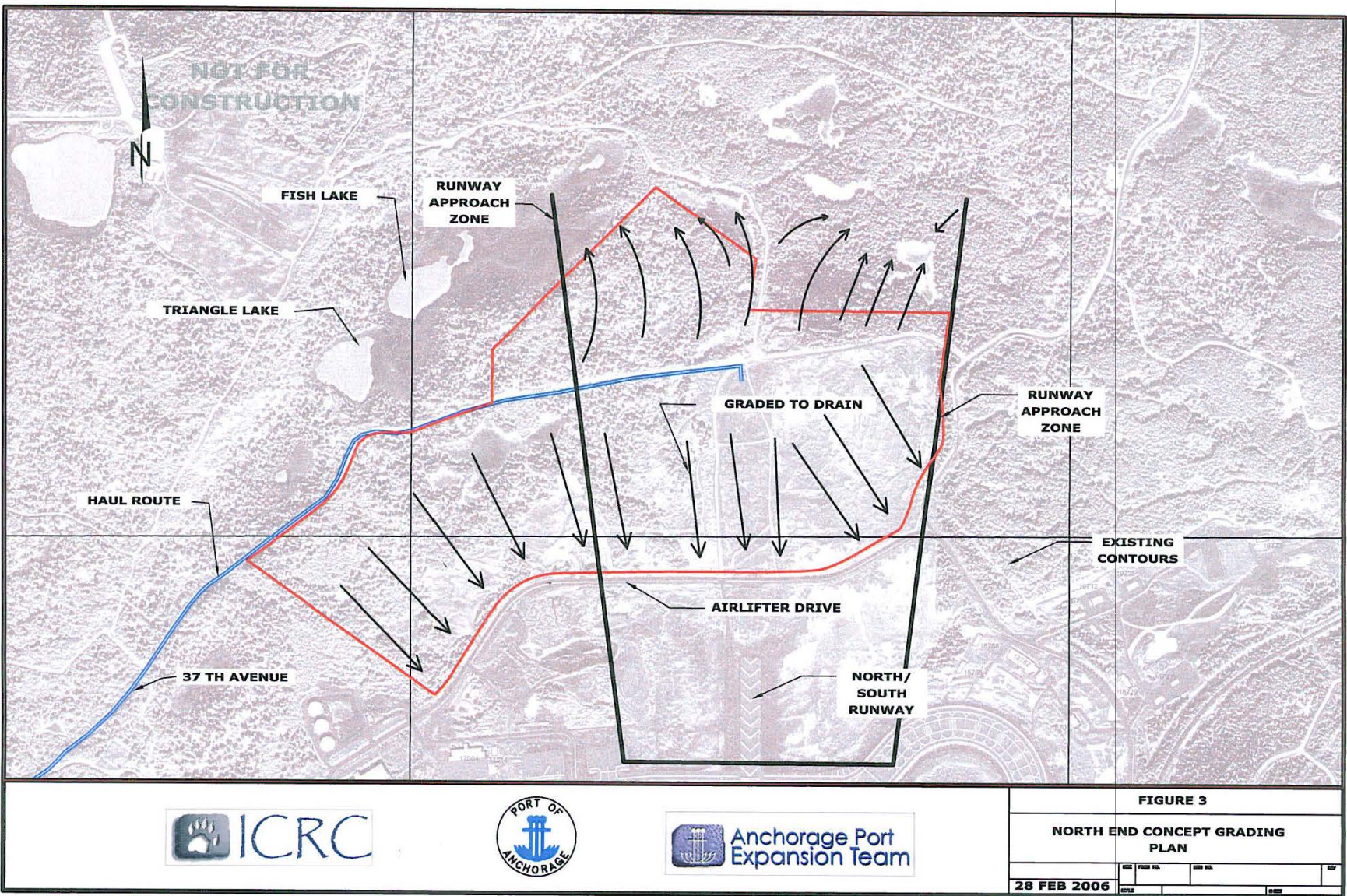
The selected operations contractor(s) would be responsible for proper mining of the material source consistent with the plan shown in Figure 3, and developing a mining plan specific to the operations and amount of material to be used.

The selected operations contractor(s) would also be responsible for developing and implementing all sediment and erosion control measures necessary, including a SWPPP per United States Environmental Protection Agency (USEPA) regulations and EAFB guidance provided in EAFB's SWPPP Guidance for Construction Activities (EAFB, 2004a). The uppermost layer of material would be cleared, grubbed, and stockpiled on site to be used for reclamation. An expected minimum of 0.9 million cubic yards of reject material would be excavated in the process of obtaining the engineered and common fill. This material would be blended with the grubbed material and used as cover for reclamation.

Pit Reclamation/Revegetation

Stockpiled reject and organic material would be spread throughout the post-mined North End Borrow Site to contours detailed in annual reclamation specifications. For aesthetics and erosion control, vegetative cover would be re-established as shrub habitat per specifications provided by EAFB. Additionally, the overburden previously stockpiled would be used where possible to provide rootstock to promote reintroduction of native species. Reinvasion of natural species would be permitted. Water would be provided through the use of a water truck and sprayer hose system during germination. The area would be monitored after germination to ensure no non-native noxious weed invasion occurs, and to determine if further reseeding is required. The actual species mixtures, revegetation processes, and monitoring programs will be defined by MARAD in annual reclamation plans reviewed and approved by MARAD, EAFB, BLM, and the Alaska Department of Natural Resources (ADNR) as appropriate.

MARAD would prepare and implement annual reclamation plans for each interim construction season at the North End Borrow Site, as well as a reclamation plan for final closure of the entire North End Borrow Site and haul route corridor. The reclamation planning would also incorporate drainage systems to prevent standing water that may attract birds to the end of the North/South Runway. Other materials may also be imported from other EAFB locations for landscaping and drainage. Reclamation plans will be reviewed and approved by MARAD, EAFB, BLM, and the ADNR consistent with long-term use plans for EAFB.



Alternative 1 meets the criteria for purpose and need as follows:

- Best available engineering estimates indicate that material could be provided to the MTR project from the North End Borrow Site for a cost of approximately \$7.25 per cubic yard. This represents a cost savings of between \$4.75 and \$9.75 per cubic yard over other commercial sources.
- The North End Borrow Site can provide as much as 9.8 million cubic yards, or approximately 80 percent of the required MTR project materials.
- The material available at the North End Borrow Site meets the required engineering specifications.

The North End Borrow Site is approximately 4.75 miles from the Port. Sites within EAFB are substantially closer to the MTR project than any other potential source.

2.2.2 Alternative 2: Excavate and Conduct Minimal Road Improvements

This alternative involves excavating fill material from the Proposed Action area, similar to Alternative 1. The same transportation route shown in Figure 2 would be used for transport. However, instead of implementing major road improvements and widening roads, the existing unimproved roads would be used with only minimal, localized improvements. An estimated eight acres of land may be disturbed as a part of these road improvements. Truck size would be limited to approximately 25 tons in capacity, increasing the number of truck-trips to provide the same quantity of material.

Future rerouting of storm water by EAFB through the Cherry Hill Borrow Site, described in Alternative 1 would apply to Alternative 2 also.

The selected operations contractor(s) would be responsible for maintaining the roads in the transportation route, and the MTR project contractor would be responsible for conducting operations in a manner that ensures safety and success, such as covering loads and conducting debris removal, if necessary. Excavation within the North End Borrow Site and follow-up reclamation would be conducted as described in Alternative 1.

2.2.3 Alternative 3: “No-Action”

An alternative to expanding the North End Borrow Site is to use other sources to provide the entire quantity of MTR project fill. Under the “No-Action” Alternative, no material from the North End Borrow Site would be used and all MTR project fill material would be purchased competitively from commercial providers, non-commercial providers, or a combination of the two. No existing single source can provide the entire required volume. Potential commercial providers include known suppliers such as: AggPro; Central Paving Products; Denali Materials; Anchorage Sand and Gravel; and other independently owned and operated retail borrow sites. Non-commercial providers may include EAFB (locations other than the North End Borrow Site); Fort Richardson; the Matanuska-Susitna Borough; and various native landholdings under the Alaska Native Claims Settlement Act. ADNRC has provided a list of approved borrow sites within approximately

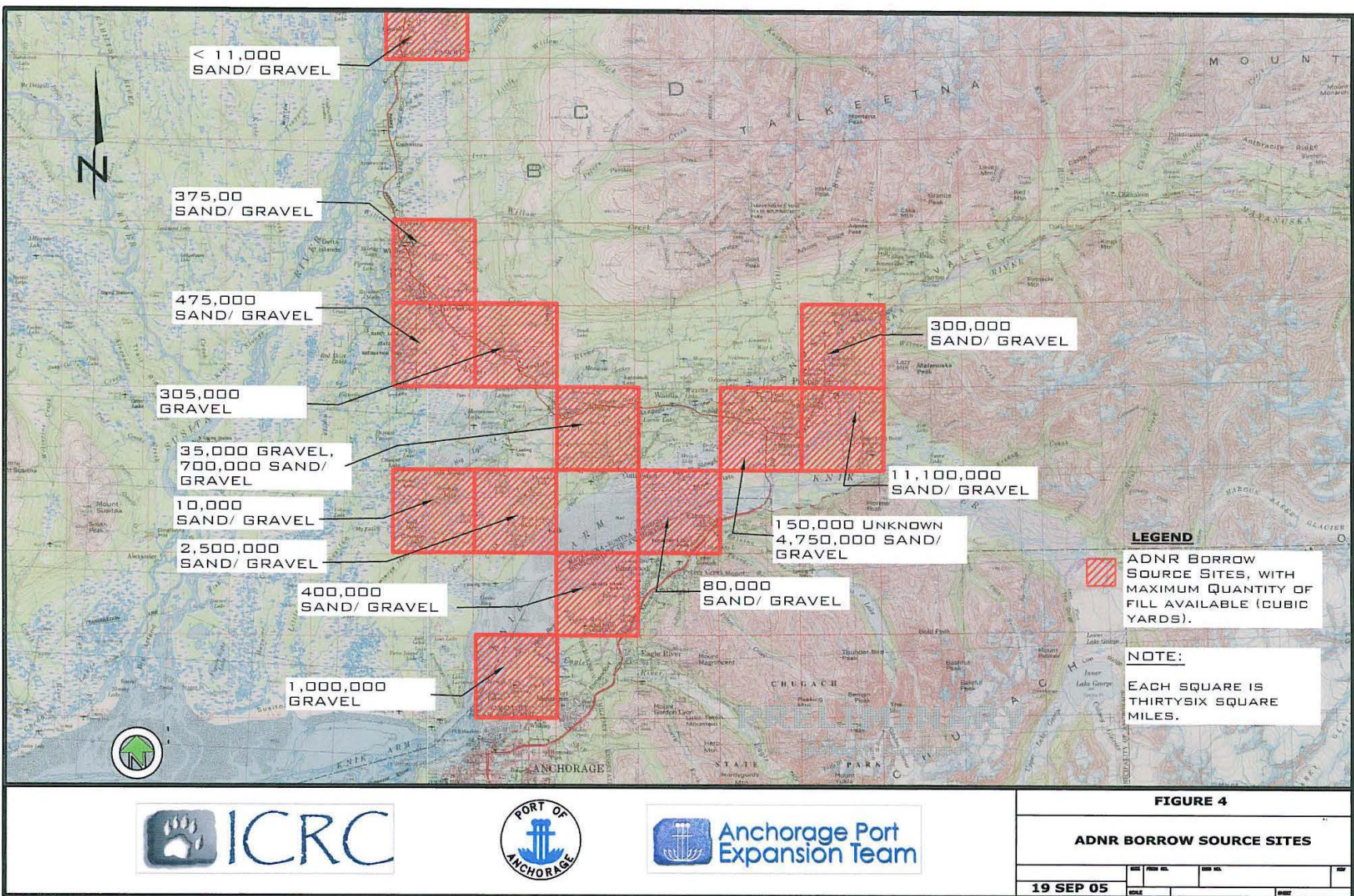
70 miles of the MTR project site that have train or highway access, and thus are potential sources MARAD could consider for the MTR project (ADNR, 2004). Figure 4 shows the location of these sites, along with the maximum amount of fill determined to be available at each site. The requirements of the MTR project are large enough to have an impact on commercially available sources, given other demands, and would potentially necessitate opening new pits.

Under the “No-Action” Alternative, the MTR project contractor selected for each phase as part of a MARAD-approved competitive bidding process would determine the source(s) of material. There would be a requirement to adhere to existing laws and regulations governing removal, transport, and placement of fill material, and to implement Best Management Practices (BMPs). Contract terms would specify that materials can be obtained only from appropriately permitted sources, must be substantially contaminant free, and must meet minimum engineering specifications.

Material from more distant sites, under the “No-Action” Alternative would likely be transported by public road, commercial rail, and/or barges traveling over public waterways under aforementioned transportation restrictions. For comparison purposes, one train with 80 cars carrying 100 tons of material in each car could transport 8,000 tons of fill; ten 25-ton trucks bringing in material every hour could transport 4,000 tons of fill per 16-hour day (160 truck-trips); and a single barge could transport approximately 6,750 tons of material per trip.

The existing rail system at the POA is neither located appropriately nor of sufficient capacity to provide optimal support for substantial material delivery. MARAD presently is extending the system along the east side of the Port to provide rail access and capacity. However, the track extension will not be complete until 2011 (APET, 2004).

Truck transport by road could be used to provide a portion of the MTR project fill, but could not be used as a stand-alone option due to capacity limitations (36,000 tons by truck from public road). Barging and rail transport, once track construction is complete and certified for commercial use, could be used for supplying either a portion or all of the material.



3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

According to the analysis in this North End Runway Material Extraction EA, implementation of the Proposed Action or Alternative 2 would result in adverse but not significant impacts in any resource category, with the exception that Alternative 2 will require a conformity analysis under the Clean Air Act due to potential major impacts on CO levels in the Anchorage Bowl. Implementing the Proposed Action would not negatively affect existing conditions to a significant degree at the North End Borrow Site, along the proposed haul route, or in adjacent areas. Less than significant adverse impacts would occur to air quality, noise levels, ground water, vegetation, wildlife, surface water, and wetlands. The action or Alternative 2 would result in the removal of approximately 12 acres of wetlands. However, the wetlands located generally north of the runway create a hazard to waterfowl habitat that EAFB must address under the Bird Aircraft Strike Hazard (BASH) program. If the Proposed Action or Alternative 2 is implemented, mitigation would likely be needed to avoid, reduce, or compensate for adverse impacts to wetlands, likely occurring as compensatory or offsite mitigation. Procedures regarding the wetland loss would be addressed through the United States Army Corps of Engineers (USACE) wetland permit process. The “No-Action” Alternative would result in impacts ranging from not significant to significant, depending upon the selected source area(s) and transportation method. A summary of the potential impacts by resource category for the Proposed Action and alternatives is presented in Table ES-1.

3.1 PHYSICAL RESOURCES

3.1.1 Air Quality

The USEPA developed standards for pollutants that are common throughout the country and can negatively impact health or harm the environment. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. The Clean Air Act (CAA) and its subsequent amendments (CAAA) established the National Ambient Air Quality Standards (NAAQS) for six “criteria” pollutants:

- Ozone (O₃);
- Carbon monoxide (CO);
- Nitrogen dioxide (NO₂);
- Sulfur dioxide (SO₂);
- Particulate matter measuring less than 10 microns in diameter (PM-10); and
- Lead (Pb).

Affected Environment

The location of the proposed project is over four miles north of downtown Anchorage. Anchorage enjoys relatively good air quality, with levels of most pollutant emissions within the required standards. Anchorage has historically experienced elevated CO concentrations during the winter months, resulting primarily from incomplete combustion

of fossil fuels. A portion of Anchorage was formerly designated as a non-attainment area for CO, but was reclassified as an attainment area in July 2004. This area included downtown Anchorage, Ted Stevens Anchorage International Airport, and locations as far south as O'Malley Road and east to Muldoon. The northern boundary extended westward along the Glenn Highway to about Pine Street, then continued in a straight westward line to the Knik Arm on the northern side of the Ship Creek basin. The area is now a maintenance area for CO in compliance with Federal General Air Conformity rules and regulations. EAFB lies to the north of and outside of the maintenance area, and is therefore not required to perform conformity analyses for actions occurring on base.

Eagle River is designated as a non-attainment area for PM-10. The rest of the Municipality of Anchorage (MOA) and EAFB are currently in attainment for all criteria pollutants. Although the distance from Eagle River to the North End Borrow Site precludes any effect on PM-10 in Eagle River, it is addressed here because it is a general concern for MOA.

A portion of the North End Borrow Site has been intermittently used as a material source for EAFB construction projects over the last ten years, periodically resulting in air emissions similar to those that would occur from implementing the Proposed Action but on a more limited basis.

Environmental Consequences

Alternative 1: Proposed Action

Air emissions that would be generated under the Proposed Action potentially include dust from the physical movement of soil and CO, SO₂, and NO₂ generated by diesel vehicles extracting and hauling material, and by material screening conducted prior to hauling. Of these, CO is the primary pollutant of concern for the Anchorage area. Total additional project CO emissions of 100 tons would be considered as exceeding the general conformity levels for a nonattainment area, and 100 tons of PM-10 would be the threshold for an attainment area, as stipulated in the SIP. Although EAFB is in an attainment area and is not required to conform to the SIP, the *de minimis* levels are used here as a measure of significance. Even though analysis and general conformity levels are based on annual totals, it should be recognized that the material excavation and transport, and generation of most of the pollutants would occur during the summer and not during the winter when CO levels are highest.

The Proposed Action does not exceed the *de minimis* levels and conforms to the SIP. The amount of construction equipment used would cause an incremental, but not long-term or significant, increase in emissions for the duration of the Proposed Action. Material processing would generally be performed year-round. However, excavation and transportation of material generally only occurs from April through October and not during winter months when Anchorage air quality is more likely to suffer from increased emission load.

Assuming a US Army FM5-34 conversion factor of 1.25 loose cubic yards per bank cubic yard of common earth, 12.2 million loose cubic yards of material will be

transported over the life of this project. The emissions in tons for diesel engine emissions for the anticipated equipment use associated with moving 12.2 million cubic yards of material over the life of the Proposed Action are shown in Table 3-1.

Table 3-1
Alternative 1: CO and PM-10 Emission Calculations
From Diesel-Burning Equipment (Total Over Project)

Equipment	Rated (hp)**	Equipment Hours/Day*	Total Hours	Emission Factors (lb/hp-hr)		Total Emissions (tons)	
				CO	PM-10	CO	PM-10
4 Excavators (average, same for all size dump trucks)	275	48	25,920	0.00668	0.0022	23.8075	7.8408
25-ton Belly Dump Truck (45)	489	540	291,600	0.00668	0.0022	476.2586	156.8516
Total Excavator and 25-ton Belly Dump Truck Transport Emissions						500.0661	164.4924
40-ton Dump Truck (32)	518	384	207,360	0.00668	0.0022	358.7577	118.1537
Total Excavator and 40-ton Dump Truck Transport Emissions						382.5652	125.9945
100-ton Dump Truck (16)	1000	192	103,680	0.00668	0.0022	346.2912	114.0480
Total Excavator and 100-ton Dump Truck Transport Emissions						370.0987	121.8888

* Based on 12 hours of operation daily for each piece of equipment.

** (AP 42, 2005)

A second source of criteria pollutants is the potential for PM-10 emissions, caused by fugitive dust generated from mining and hauling operations. Whenever required by weather conditions, water would be used to decrease dust emissions from these operations. Table 3-2 calculates the potential fugitive dust emissions based on the three types of trucks that may be used for material hauling. Total tonnage is based on 12.2 million cubic yards of material.

Table 3-2
Alternative 1: Calculations for Fugitive Dust (Total Over Project)

Process	Tons of Gravel	Miles of Travel	Emission Factor (lb/ton or mile)	Total PM-10 Emissions (tons)
Truck Loading/Unloading	18,300,000	N/A	0.000016	0.1464
25-ton Belly Dump Trucks Hauling on Dirt Roads – Empty	N/A	3,210,526	0.01887051	30.2921

Process	Tons of Gravel	Miles of Travel	Emission Factor (lb/ton or mile)	Total PM-10 Emissions (tons)
25-ton Belly Dump Trucks Hauling on Dirt Roads – Full	N/A	3,210,526	0.02850078	45.7513
40-ton Dump Trucks Hauling on Dirt Roads – Empty	N/A	2,033,333	0.03660159	37.2116
40-ton Dump Trucks Hauling on Dirt Roads – Full	N/A	2,033,333	0.05375776	54.6537
100-ton Dump Trucks Hauling on Dirt Roads – Empty	N/A	813,333	0.03660159	14.8847
100-ton Dump Trucks Hauling on Dirt Roads – Full	N/A	813,333	0.03688917	15.0016

Although activities associated with the material extraction could cause localized degradation of air quality, the impact would not be significant in the context of EAFB's overall excellent air quality during the summer months. In addition, BMPs, such as watering unvegetated ground surfaces to suppress dust emissions during dry weather, would be implemented. Dust from previous material extraction operations was not known to cause an impact to surrounding air quality.

The Proposed Action would include improving and widening roads for the haul trucks. Dust from these dirt roads would be controlled using watering and other BMP control techniques. These roads would be restricted to the general population and BMPs would be used to keep dust and particulate matter to a minimum. Emissions would be decreased compared to Alternative 2 because fewer truck trips would be required. The emissions, in tons, for the anticipated equipment use associated with improving the roads are shown in Table 3-3. MARAD anticipates that all road improvement would occur in one construction season, and material extraction would begin the following year.

Table 3-3
Alternative 1: CO and PM-10 Emission Calculations
from Diesel-Burning Equipment for Road Improvements in 2006

Equipment	Rated (hp)**	Hours/Day	Total Hours	Emission Factors (lb/hp-hr)		Total Emissions (tons)	
				CO	PM-10	CO	PM-10
Excavator	275	36	1,890	0.00668	0.0022	1.735965	0.571725
Medium Dozer	175	12	630	0.00668	0.0022	0.368235	0.121275
Grader	200	6	315	0.00668	0.0022	0.21042	0.0693
Water Truck	489	6	315	0.00668	0.0022	0.5144769	0.1694385
Compactor	145	6	315	0.00668	0.0022	0.1525545	0.0502425
Dump Truck	518	96	5,040	0.00668	0.0022	8.7198048	2.871792

Equipment	Rated (hp)**	Hours/ Day	Total Hours	Emission Factors (lb/hp-hr)		Total Emissions (tons)	
				CO	PM-10	CO	PM-10
(12 cubic yard)							
Total						11.701456	3.853773

* Based on 12 hours of operation daily for each piece of equipment.

** (AP 42, 2005).

In both Alternatives 1 and 2, material would be excavated, screened, and stockpiled prior to hauling to the Port. The fugitive dust emissions associated with controlled screening of the material are shown in Table 3-4, and the emissions associated with the diesel-burning equipment used to extract the material are shown in Table 3-5. This screening operation could continue year-round, if necessary, and total tonnage shown below is for the life of the Proposed Action.

Table 3-4
Alternatives 1 and 2: Calculations for PM-10 Emissions
from Material Screening (Total Over Project)

Tons of Material	Pounds PM-10/tons of Material	Total PM-10 Emissions (tons)
18,300,000	0.0022	20.13

Table 3-5
Alternatives 1 and 2: CO and PM-10 Emissions
from Diesel-Burning Equipment Used for Material Extraction (Total Over Project)

Equipment	Rated (hp)**	Hours/ Day	Total Hours	Emission Factors (lb/hp-hr)		Total Emissions (tons)	
				CO	PM-10	CO	PM-10
Excavator	275	48	25,920	0.00668	0.0022	23.8075	7.8408
Medium Dozer	175	24	12,960	0.00668	0.0022	7.5751	2.4948
Scrapers	200	24	12,960	0.00668	0.0022	8.6573	2.8512
Water Truck	489	12	6,480	0.00668	0.0022	10.5835	3.4856
Total						50.6234	16.6724

* Based on 12 hours of operation daily for each piece of equipment.

** (AP 42, 2005).

Whenever required by weather conditions, water would be used to decrease dust emissions from these operations. BMPs would be used to keep dust and particulates to a minimum in the North End Borrow Site.

A portion of the North End Borrow Site has been periodically used for fill material for construction projects on EAFB, creating impacts similar to those above. Therefore, the types of equipment impact identified above already periodically occur in the area although on a more limited scale. It is reasonable to assume that it would not be feasible for EAFB to perform material removal concurrent with the Proposed Action.

A *de minimis* level of 100 tons is established by the federal general conformity rule and SIP as a significance threshold for total annual CO emissions. Likewise, a *de minimis* level of 100 tons total annual PM-10 emissions has been established by the USEPA for areas in attainment for this criteria pollutant. Under Alternative 1, there will be a maximum allowable volume of material that can be transported in any single year that will stay below these thresholds. This volume would be stipulated in project design. Estimates of maximum year emissions would be 92.78 tons of CO and 53.46 tons of PM-10, assuming use of 40-ton trucks, the most probable alternative. Therefore, emissions generated by the action would not have a significant impact on air quality standards in the attainment area.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Under this alternative, air emissions would result from diesel-burning equipment, loading/offloading of material, excavation, and screening of material. The material excavation and screening figures in Tables 3-4 and 3-5 are applicable to this alternative as well as to Alternative 1. Anticipated emissions due to diesel-burning equipment and loading/offloading operations under Alternative 2 are shown in Tables 3-6 and 3-7.

Table 3-6
Alternative 2: CO and PM-10 Emission Calculations
from Diesel-Burning Equipment (Total Over Project)

Equipment	Rated (hp)**	Equipment Hours/Day*	Total Hours	Emission Factors (lb/hp-hr)		Total Emissions (tons)	
				CO	PM-10	CO	PM-10
4 Excavators	275	48	25,920	0.00668	0.0022	23.8075	7.8408
Belly Dump Truck (45)	489	540	291,600	0.00668	0.0022	476.2586	156.8516
Total						500.0661	164.4924

* Based on 12 hours of operation daily for each piece of equipment.

** (AP 42, 2005).

Table 3-7
Alternative 2: PM-10 Emission Calculations for Material Extraction
(Total Over Project)

Process	Tons of Gravel	Miles of Travel	Emission Factor (lb/ton or mile)	Total PM-10 Emissions (tons)
Truck Loading/Unloading	18,300,000	N/A	0.000016	0.1464
25-ton Belly Dump Trucks Hauling on Dirt Roads – Empty	N/A	3,210,526	0.01887051	30.2921
25-ton Belly Dump Trucks Hauling on Dirt Roads – Full	N/A	3,210,526	0.02850078	45.7513

The diesel emissions and PM-10 emissions in Alternative 2 are identical to the 25-ton dump truck calculations shown in Alternative 1 above. Although Alternative 2 requires more total driving miles than using larger dump trucks, they are a lesser impact on PM-10 emissions compared to Alternative 1 in that the roads do not have to be widened to accommodate transport vehicles.

Whenever required by weather conditions, water would be used to decrease dust emissions from these operations. BMPs would be used to keep dust and particulates to a minimum in the North End Borrow Site.

Under Alternative 2, total annual CO emissions from the action in the maximum projected construction year would be 135.78 tons, exceeding the *de minimis* level of 100 tons. The increased CO emissions for this alternative are caused by the increased number of driving hours needed when using smaller vehicles than those used in Alternative 1. Projected total annual PM-10 emissions would be 63.68 tons, which does not exceed *de minimis* levels of 100 tons established by the federal general conformity rule and SIP.

Alternative 3: “No-Action”

Air emissions generated under this option potentially could be greater than either of the other alternatives. Material would be hauled substantially farther, (depending upon some locations) and the CO emissions from diesel-burning equipment would be increased proportionately. PM-10 emissions for the actual extraction would theoretically be the same since the same amount of fill would be extracted, but would occur at a different location.

3.1.2 Noise

Sound level is measured in units called decibels (dB). The dB system of measuring sound provides a simplified relationship between sound level and its perceived loudness to the human ear. Because environmental noise fluctuates from moment to moment, it is common practice to describe the noise environment in a single number, called the equivalent sound level (Leq). Often the Leq values over a 24-hour period are used to calculate cumulative noise exposure in terms of the Day-Night Sound Level (Ldn). Ldn is the A-weighted Leq for a 24-hour period with an added ten-dB penalty imposed on noise that occurs during the night time hours between 10 p.m. and 7 a.m.

Affected Environment

Increased noise due to implementing the Proposed Action and its alternatives would be attributable to two distinct activities: 1) excavating at the North End Borrow Site, and 2) transporting fill material to the POA. Both activities and location must be considered when determining the impact to existing noise levels.

Given the nature of the POA’s activities and MARAD’s role as an agency of USDOT, the most applicable federal guidelines for noise are those issued by the Federal Transit Administration (FTA, 1995). FTA guidelines classify three categories of land use with special sensitivity to noise; they are:

- Buildings or parks where quiet forms a basic element of their purpose;
- Residences and buildings where people normally sleep (e.g., homes, hotels, hospitals) where nighttime noise is most annoying; and
- Institutional land uses (e.g., schools, libraries, active parks, churches) with primarily daytime and evening use.

In addition to FTA guidelines, USEPA criteria state that construction noise resulting in an hourly equivalent sound level of 65 A-weighted decibels (dBA) at a sensitive receptor (e.g., hospital, residence, church) represents a significant impact.

Anchorage also has a noise control ordinance (GAAB 16.85.010; AO No. 78-48) that establishes limits on construction noise depending upon the time of day and the zoning of the receiving property. The ordinance prohibits construction noise in excess of an Leq of 80 dBA during any one hour at or within a residential real property boundary or within a noise sensitive zone (e.g., hospitals) between the hours of 10:00 p.m. and 6:00 a.m. during the typical construction season (April 1 through October 31). It also prohibits creating a “noise disturbance” in a residential area between 10:00 p.m. and 6:00 a.m.

The North End Borrow Site neither includes nor abuts land assigned to FTA categories of noise sensitive land use. There are no sensitive receptors located within 1.0 mile of the site.

Existing Background Noise

Periodic use of vehicles for material removal represents the primary direct noise sources currently affecting the North End Borrow Site. Other nearby sources include low-flying military aircraft departing and arriving at EAFB immediately to the south. Vehicle and related equipment noise is transient and infrequent, generating very low (under 45 Ldn), short-term, and localized (within approximately 100 feet) noise levels. Urban daytime noise levels are approximately 45 dBA (APET, 2004).

According to the 1993 Air Installation Compatible Use Zone Study (EAFB, 2003), noise generated by aircraft results in levels ranging from 75 to more than 80 dB Ldn in the vicinity of the North End Borrow Site (APET, 2005), comprising the greatest level of noise. A jet flyover at 1,000 feet generates approximately 110 dBA (APET, 2005).

Existing background noise levels are assumed to be approximately 45 dBA. Background noise during aircraft flyover is calculated as shown below.

Background Noise During Aircraft Flyover:

$$10 \log (10^{45 \text{ dBA}/10} + 10^{110 \text{ dBA}/10}) = 110 \text{ dBA}$$

Environmental Consequences

Noise impacts were examined using criteria established by the FTA as well as the MOA noise ordinance. FTA criteria consider both the amount of change in noise levels and the cumulative noise level resulting from a project (FTA, 1995). To result in an impact, projected noise levels must exceed these criteria. The MOA noise ordinance prohibits construction noise of an Leq greater than 80 dBA in residential areas.

Alternative 1: Proposed Action

Noise anticipated as a result of excavating operations at the North End Borrow Site is less than significant compared with the noise generated from aircraft operations using the adjacent runway. In addition, similar noise levels are periodically generated from ongoing EAFB material removal. No significant impact to noise levels at any sensitive receptor is anticipated as a result of implementing the Proposed Action.

Anticipated Construction Noise Levels

Increased noise associated with the Proposed Action would be caused by heavy equipment used to extract, process, and transport fill material. This includes diesel-burning equipment such as brush cutters, excavators, front-end loaders, and dump trucks.

Noise from excavation activity varies with the types of equipment used and the duration of use. Heavy equipment of the type associated with excavation activities generates noise levels typically ranging from 70 to 90 dBA at a distance of 50 feet. Chart 1 depicts typical noise levels associated with construction equipment.

Noise would be reduced to substantially below the 65 dBA level at the nearest sensitive receptor, an EAFB library, over one mile away. Attenuation from the North End Borrow Site to the library would result from the distance between them.

Calculations for increased noise levels to potential receptors at aviation operation support buildings, approximately 1,000 feet away, as a result of Proposed Action activities are listed below.

Construction Noise Adjusted for Distance and Vegetation Attenuation:

$$90\text{dBA} - [20 \log (1,000 \text{ ft}/50)] - (1,000 \text{ ft} \times 0.03 \text{ dBA/ft}) = 34 \text{ dBA}$$

Construction with Existing Background Noise:

$$10 \log (10^{45\text{dBA}/10} + 10^{34 \text{ dBA}/10}) = 45 \text{ dBA}$$

Construction with Existing Background Noise during Aircraft Flyover:

$$10 \log (10^{110 \text{ dBA}/10} + 10^{45 \text{ dBA}/10}) = 110 \text{ dBA}$$

Noise levels during military aircraft flyover would not exceed the FTA criteria in combination with the Proposed Action. The increase in noise during times when military

aircraft are not overhead is less than 1 dBA, which is below FTA's noise impact criteria for classification as both an impact (7 dBA) and a severe impact (14 dBA).

Calculated cumulative noise as a result of background noise and the Proposed Action activities would be 45 dBA, which is below FTA's criteria for classification as both an impact (53 dBA) and a severe impact (59 dBA).

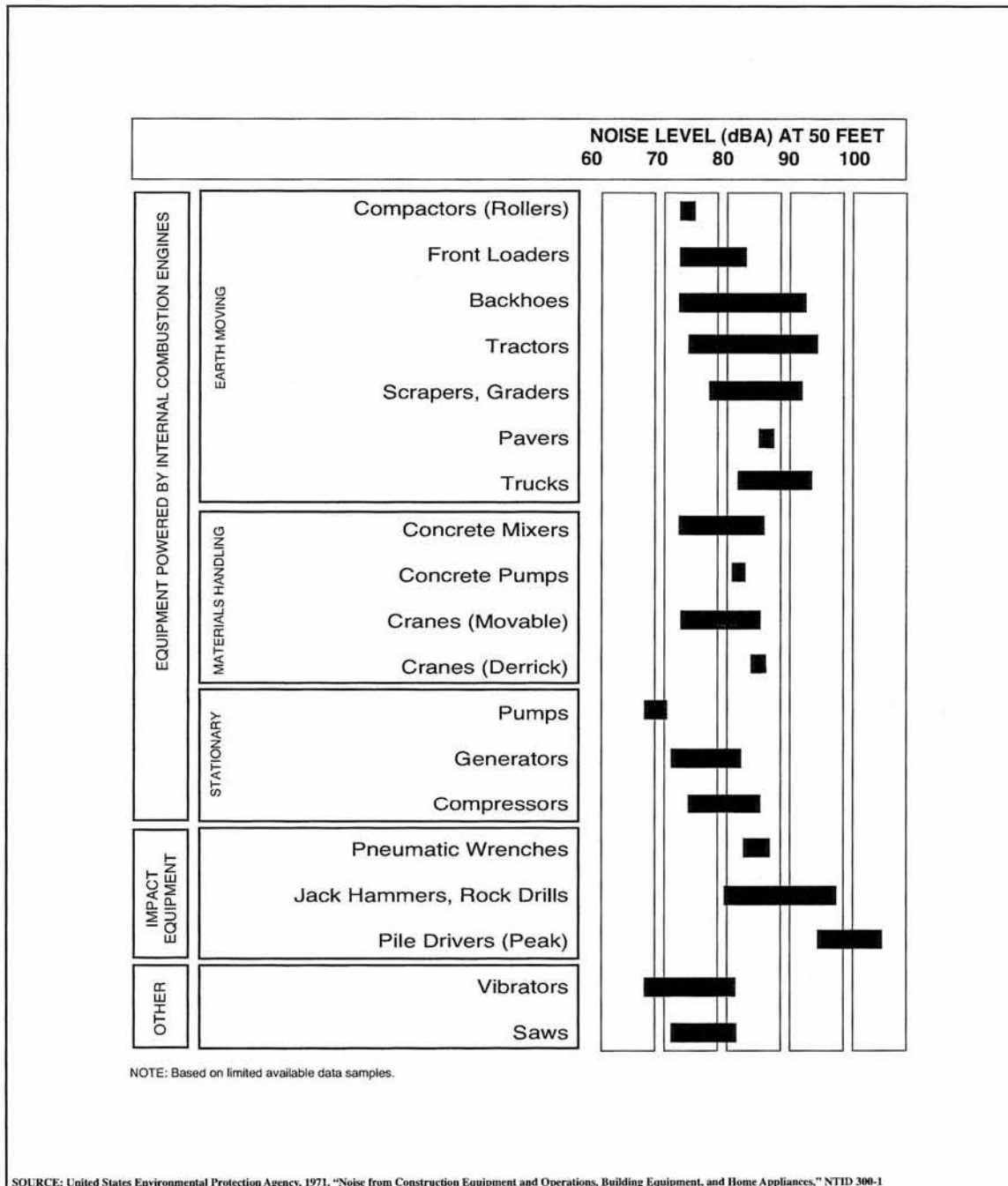


Chart 1: Typical Noise Levels Associated with Construction Equipment

Estimated noise values for the Proposed Action activities also fall below USEPA's criterion for a significant impact due to noise generated by construction at sensitive receptors (65 dBA), and the Anchorage noise ordinance prohibiting construction noise above 80 dBA in residential areas.

Less than significant impacts to non-workers would result from excavation at the North End Borrow Site for the following reasons:

- Noise generated by continued aircraft operations at adjacent EAFB would dominate ambient noise levels.
- Using a direct-access transportation route to the Port would reduce total vehicle travel. These roads would be restricted to the general public and are located away from areas of higher traffic patterns. Noise would have little or no impact on nearby receptors due to attenuation.
- Heavy equipment that would generate the highest noise levels would not be used consistently enough to exceed the hourly equivalent noise level of 75 dBA for more than one hour beyond the boundaries of the borrow pit and transportation corridor. Local noise levels within the North End Borrow Site would likely exceed this level, but attenuation would cause this level to be reduced for offsite receptors.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Less than significant impacts would be anticipated as a result of implementing Alternative 2. Since the extraction site and material volume are the same as in the Proposed Action, the noise and vibration created during excavation and the potential receptors impacted would be the same as discussed above.

Under this alternative, trucks would use the same haul route as Alternative 1, with the exception that the roads would be largely unimproved and; therefore, narrower. Due to the narrower road width, trucks would be limited to a 25-ton capacity. Therefore, there would be an estimated 1,000 trips per day required to deliver 20,000 cubic yards to the Port.

Calculations for increased noise levels to potential receptors at aviation operation support buildings, approximately 1,000 feet away, as a result of Alternative 2 activities are listed below.

Construction Noise Adjusted for Distance and Vegetation Attenuation:

$$90\text{dBA} - [20 \log (1,000 \text{ ft}/50)] - (1,000 \text{ ft} \times 0.03 \text{ dBA/ft}) = 34 \text{ dBA}$$

Construction with Existing Background Noise:

$$10 \log (10^{45 \text{ dBA}/10} + 10^{34 \text{ dBA}/10}) = 45 \text{ dBA}$$

Construction with Existing Background Noise during Aircraft Flyover:

$$10 \log (10^{110 \text{ dBA}/10} + 10^{45 \text{ dBA}/10}) = 110 \text{ dBA}$$

As shown above, noise levels during military aircraft flyover would not be affected by Alternative 2 activities. The increase in noise at potential receptors during times when military aircraft are not overhead is less than one dBA, which is below FTA's noise impact criteria for classification as both an impact (7 dBA), and a severe impact (14 dBA).

Calculated cumulative noise as a result of background noise and Alternative 2 activities could reach 45 dBA, which is below FTA's noise impact criteria for classification as an impact (53 dBA), and a severe impact (59 dBA).

In addition to FTA's criteria, estimated noise values for Alternative 2 activities fall below USEPA's criteria for a significant impact due to noise generated by construction at sensitive receptors (65 dBA) and the MOA noise ordinance prohibiting construction noise above 80 dBA in residential areas.

Alternative 3: "No-Action"

No significant impacts would be anticipated as a result of implementing Alternative 3. Commercial borrow pits are generally located and operated so as to minimize noise impact on communities and populations. Isolation of the noise making activity can be accomplished by geographical distance or the presence of natural barriers such as vegetation and hills.

Transport of material along public roads and railway from a commercial source potentially could cause increased noise. Vehicles, in general, and diesel engines in particular, are sources of noise which annoy and disturb operators and others in the vicinity.

Transport of material by barge would be a source of noise, but the noise would largely be separated by distance to sensitive human receptors. In addition to noise in the air, underwater noise can be produced by operation of vessels; i.e., barges. Marine life within the vicinity of a barge actively transporting, storing, and offloading material would be subjected to increased underwater noise.

Increased noise along public thoroughfares, railways, or barge routes due to MTR project activities would occur in the short-term (through 2011), and would; therefore, not have a long-term impact on the existing noise environment.

3.1.3 Hazardous Materials and Waste

Hazardous waste is a specially regulated subset of solid waste. Hazardous wastes exhibit one or more of the following characteristics: toxicity, corrosivity, ignitability or reactivity, or are specifically listed on one of four hazardous waste lists. These wastes are specially regulated, because they pose a substantial threat to human health or the environment if they are improperly managed. The Resource Conservation and Recovery Act (RCRA) regulates the generation, accumulation, transport, storage, treatment, and

disposal of hazardous wastes. RCRA requires all generators of waste to evaluate each waste stream to determine if it is a hazardous or non-hazardous waste. While non-hazardous wastes may generally be disposed of in a municipal landfill, hazardous waste must be properly labeled, transported, treated, and disposed of at a specially permitted facility.

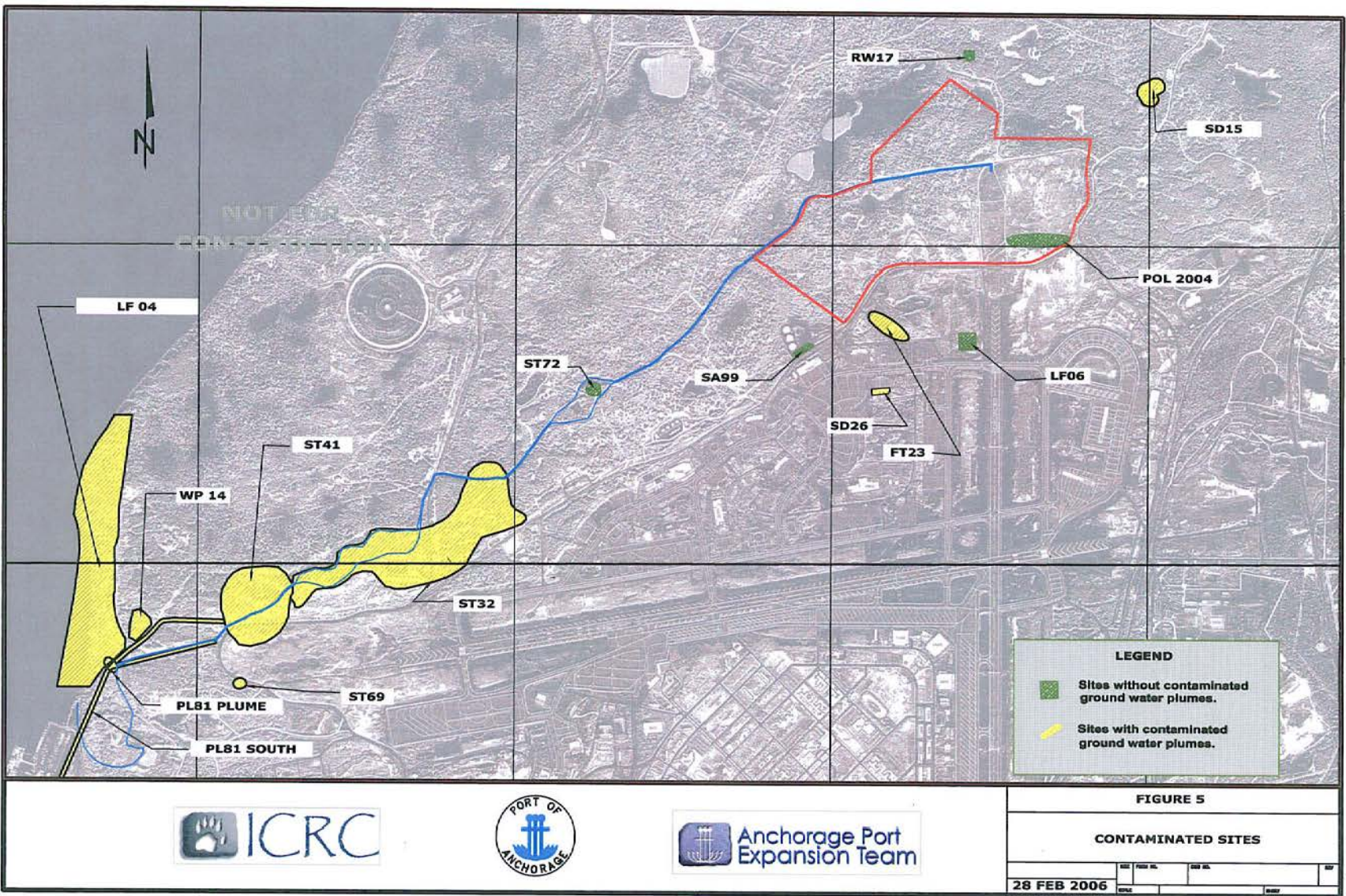
Transport of hazardous materials is regulated by USDOT. While being handled and stored, they are regulated by the Occupational Safety and Health Administration (OSHA) and Clean Water Act; during and after disposal, they are regulated under RCRA. The regulations for handling, transport, and storage of hazardous materials require that secondary containment be provided for materials stored outdoors, that adequate and appropriate spill response equipment be located nearby, and that materials be properly marked or placarded. These provisions decrease the chance of a spill or release of the materials.

Affected Environment

Petroleum, oils, and lubricants (POLs) would be used during operation activities using heavy equipment and generators. POLs are classified as hazardous materials, and must be handled as such. How much of these products would be consumed varies by alternative. However, the types of products used and the hazards they pose are consistent throughout.

Numerous contaminated sites have been identified at the base. The proposed transport route alignment crosses several known sites, and several others are located in close proximity to the project. Each of these sites is currently being monitored and treated, or has been treated and is currently below the target cleanup levels specified in applicable decision documents. The following contaminated sites without associated plumes are located within 0.25 miles of the proposed excavation area and transport route (See Figure 5):

- RW17 was once suspected of containing small quantities of buried cyanide and radium. Radioactive analysis found that no radioactivity above background levels was detected. Based on results of site monitoring conducted by the United States Air Force (USAF), no present potential for contamination exists. This site was classified as No Further Action (NFA) in the Federal Facility Agreement signed in 1991 (EAFB, 2001b).
- LF06 is a landfill located south of Airlifter Drive. It was originally used as a gravel borrow site. From 1951-1964 the borrow pit was filled with clean construction and demolition debris. There is no evidence that hazardous materials were disposed of at this site. The site has been covered with two feet of soil and revegetated. There are no indications of erosion, contamination, or other compliance problems.
- ST72 is adjacent to 37th Street and on the proposed haul route. The source of ST72 is leaking underground storage tanks (USTs) and related piping. A 500-gallon gravity fed UST was removed in August 1992 and replaced with a 1,200-gallon UST. Approximately 300 cubic yards of contaminated soil was removed. This site was closed in July 1998.



- SA99 is located approximately 70 feet north of Airlifter Drive and is the site of a former drum disposal and storage area. Historical aerial photographs indicate that the area may have been a landfill between 1952 and 1962. Crushed drums were discovered during excavation work in 1998. Metal drums in various stages of decay and POL contaminated soil were excavated and transported for disposal. Utility line excavation activities in 1999 revealed additional crushed drums in the area. The area is currently the location of a POL distribution station operated by EAFB. A site-investigation report completed in 2003 found soil and water samples to be below ADEC Method 2 Cleanup Levels and no further action is required.
- 2004 POL is the only known contaminated site within the boundaries of the North End Borrow Site. The area does not have an official designation by EAFB, but is labeled 2004 POL on Figure 5. During excavation activities by EAFB at the North End Borrow Site during June of 2004, an excavator operator noticed an odor in the soil. As a result, approximately 160 cubic yards of soil from trucks that were in the process of hauling the suspect material, as well as soil that had been recently dumped, was returned to the location of origin and placed in a stockpile. Excavation activities were moved to a different location and no attempt was made to delineate the in-situ extent of contamination. One analytical sample was collected and analytically tested. Diesel range organics were measured at 202 mg/kg. The source of the contamination is not known.

The following contaminated sites, with associated contaminated soil and/or contaminated groundwater plumes, are located within 0.25 miles of the proposed excavation area and transport route (See Figure 5). These sites are discussed further in Section 3.2.2.

- SD15
- ST41
- ST69
- WP14
- PL81
- FT23
- SD26
- ST32
- LF04

Environmental Consequences

Alternative 1: Proposed Action

Less than significant impacts from hazardous materials and waste would be generated under the Proposed Action. Since hazardous materials used on site would be limited to vehicle fluids, few or no hazardous materials would be generated as part of the Proposed Action.

Diesel fuel would be used to power vehicles and heavy equipment operating to extract and transport fill material. Vehicles would likely be refueled on site. A SWPPP would be

required prior to initiating excavation activity and any refueling operations would be consistent with BMPs listed in the SWPPP. Any fuel potentially stored on site would be stored in a way that prevents or minimizes the chance of spills and is protective of the environment.

Small amounts of solid waste may be generated from operating diesel-burning equipment, such as used oil and oil-contaminated rags. However, a portion of this waste would be generated at equipment maintenance facilities, not at the North End Borrow Site. Use of trucks to transport the material might cause less than significant amounts of contamination from oil and fuel on the proposed haul route.

The Proposed Action may result in the discovery of solid and hazardous waste or other hazardous materials, such as discarded petroleum products, from historic operations. If wastes are found, the discovery would be immediately reported to MARAD and EAFB. MARAD would submit plans for management of hazardous waste as part of the development, operations, and reclamation plans for the North End Borrow Site. MARAD intends to leave undisturbed hazardous waste in place. Discovery of wastes from historic operations could potentially lead to their removal through the EAFB orphan drum program or contaminated site procedures; thereby eliminating associated on-site hazards.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Less than significant impacts would be expected during excavation and transport operations. Since the extraction site and material volume is the same as in the Proposed Action, impacts relating to hazardous materials would be the same as discussed under Alternative 1.

More haul trips would be made under Alternative 2 due to the smaller capacity of each truck. Thus, there would be a higher likelihood of oil and fuel contamination from the trucks along the transportation route. With proper vehicle maintenance and adherence to BMPs, the amount of incidental releases of hazardous materials along the transportation route is still expected to be below a significant level.

Alternative 3: “No-Action”

Hazardous materials used or waste generated from some other material source under this option are similar to the Proposed Action, except that more fuel would be needed to transport the material from the North End Borrow Site to the Port. Placing fuel in storage at the North End Borrow Site would not be required under this alternative. Solid waste generated from vehicle operations would also increase, as hazardous material generation is proportional to miles traveled. The selected operations contractor(s) would be responsible to report and remedy incidental releases along existing roads.

3.1.4 Visual Resources

Affected Environment

The site of the Proposed Action consists of areas with indigenous vegetation interspersed with active borrow activities; two former, but smaller, excavation areas revegetating with new growth; and a runway approach clearance zone which is periodically cleared for aircraft safety. There is a vegetative buffer between the Proposed Action site and any developed land. Visual access is largely limited to personnel in aircraft and people traversing 37th Street.

Environmental Consequences

Alternative 1: Proposed Action

Under this alternative, the site would be subdivided into portions to be either cleared, mined, or revegetated during particular years so that the appropriate amount of material is available for each year's construction activity. During operations, overburden would be stockpiled on site for future reclamation use. Upon conclusion of extraction activities, the area would be landscaped and revegetated to facilitate both drainage and natural regeneration of native vegetation. Roads and trails widened for material transport would have vegetation removed during improvement, but would still retain a native vegetation buffer along most of the proposed haul route.

The reclamation and revegetation plans would be structured to be consistent with EAFB long-term plans for use of the area. To the extent practicable, a comprehensive site rehabilitation and revegetation program would be developed to minimize visual impacts from the operation upon decommissioning. The plan would address creating a visually appealing landscape while creating grading for site drainage and revegetation. Natural revegetation can be facilitated by importing weed-free soil, and by incorporating overburden recovered from pit development into site reclamation to allow reintroduction of native species.

Aerial observers on military, commercial, and private flights may view the disturbance during the years of material extraction, but subsequent site rehabilitation would minimize any long-term visual impacts from the air. Commercial and private flights are height separated from military flights, and prohibited within the EAFB approach zone above the North End Borrow Site.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Visual impacts are the same as described in Alternative 1. There would be no road and trail improvements; however, there are no visual impacts from road improvements due to the remaining vegetative buffer.

Alternative 3: “No-Action”

The visual impacts at the North End Borrow Site would remain unchanged from their current state under this alternative. The existing borrow site would remain disturbed from previous, as well as future, material extraction. Where disturbance does not continue, naturally regenerating native plants would slowly continue to encroach on the site.

3.2 NATURAL RESOURCES

3.2.1 Geology and Soils

Affected Environment

The Anchorage Bowl has experienced glacial ice advance and retreat several times. These glacial movements left complex deposits of hard till and associated outwash deposits of varying thickness overlying bedrock. During the glacial retreats, complex deposits of washed ice-contact sediments were left in place. Outwash, consisting of mainly gravelly material, covers much of Anchorage.

Distinct clay layers can also be found through parts of the Anchorage Bowl under the glacial till. These clays are components of the Bootlegger Cove Formation (BCF) and were generally deposited in the North End Borrow Site area approximately 13,500-15,000 years ago. The formation is a relatively impervious layer of silty clay, clayey silt, silty fine sand, and medium sand with scattered pebbles, cobbles, and boulders.

The North End Borrow Site is located in the Elmendorf Moraine. This moraine extends westward from the Knik Arm through Fort Richardson. The material within the Elmendorf Moraine is varied and compacted. Particle size varies from boulders to clay. Fossils are known to be found within this moraine.

The ground surface of the North End Borrow Site has an elevation change of 120 feet. The elevation of Airlifter Drive immediately south of the borrow site is 220 feet above Mean Sea Level (MSL). The elevation of the ridge which would be excavated as part of the Proposed Action is 340 feet above MSL (EAFB, 1994).

Portions of the North End Borrow Site have been used for fill material extraction for at least ten years.

Environmental Consequences

Alternative 1: Proposed Action

No significant impacts to area geology and soils are anticipated as a result of implementing the Proposed Action alternative. Extraction of material from the North End Borrow Site is not expected to destroy a unique or valuable geological record. The structural geology is similar to that of Anchorage and surrounding areas and is well documented in literature.

Topographical changes would occur as a result of this Proposed Action. Excavation and reclamation would also change the drainage of the topography. As noted, a portion of the area has been historically used as a borrow source area. There would be a reduced availability of extractable material for future use on EAFB projects, since this resource would be used for the MTR project. The Proposed Action would require a comprehensive area reclamation plan, improving and eliminating standing water that creates a bird attractant, which in turn is an aircraft hazard.

Alternative 2: Excavate and Conduct Minimal Road Improvements

No significant impacts to area geology and soils are anticipated as a result of implementing Alternative 2. The effects of extraction and transportation activities would be the same as in the Proposed Action.

Alternative 3: “No-Action”

No significant impacts to geology and soils are anticipated as a result of implementing Alternative 3. Impacts due to material excavation would be similar to those for material excavation under the other two alternatives. Material would be removed and elevation reduced at the source site. Borrow pits are purposely located; however, such that these impacts typically are not significant. Transportation of excavated material would occur along existing thoroughfares, railways, or barge routes. No road improvement or construction would be required from an existing, more remote source.

3.2.2 Ground Water

Affected Environment

There are two principal ground water resources identified at EAFB: 1) a shallow, unconfined aquifer system, and 2) a deeper artesian (confined) aquifer. The BCF, a clay and silt deposit with lesser amounts of sand and cobble material separates these two systems. The BCF acts as an aquitard, restricting vertical water movement in the confined aquifer.

The confined aquifer beneath the BCF is typically 100 feet below ground surface (bgs). The hydrogeologic units of the formation include sand and gravel outwash, alluvial sands, and mixed till deposits. Confined aquifer piezometric flow at EAFB and in the Anchorage Bowl is generally in a westerly direction toward Knik Arm, with a hydraulic gradient of 25 feet per mile (Terracon, 2005b).

A shallow ground water aquifer flows across the southern part of EAFB in a southwesterly direction, toward Knik Arm (EAFB, 1994). Based upon groundwater monitoring data, there is contamination in portions of the shallow aquifer on site. At the toe of Elmendorf Moraine and at the location of the present sand pit, shallow, unconfined aquifer water levels are approximately 35 feet bgs.

Known contaminated sites along the haul route, as well as those closest to the excavation area, are shown in Figure 5. Based on mapped data available at the EAFB website, the

boundaries of the proposed North End Borrow Site are well outside of the associated plumes, although actual plume extent may vary. All plumes are actively being monitored as part of the EAFB Remediation Program. Cleanup remedies have been documented for these areas and groundwater is being monitored through an ongoing EAFB program.

The SD15 Plume is located approximately 200 yards from the eastern extreme of the North End Borrow Site. The plume is a result of the releases from a former sludge disposal site, located northeast of the Proposed Action area. SD15 consists of three 30-foot by 40-foot concrete pads used to weather fuel filters and tank sludge between 1970 and 1983 (EAFB, 2005a). SD15 is monitored at monitoring wells OU6 MW-17, -18 and -19, and is still being actively treated to achieve Record of Decision (ROD) cleanup levels (EAFB, 1996).

The haul route crosses the ST41 South Plume on the west end of Elmendorf Moraine. The plume is a result of releases from four former 1,000,000-gallon fuel storage tanks. EAFB actively remediated “Four Million Gallon Hill” from 1976 to 1999 to remove and treat dissolved phase fuel constituents and free product floating on the ground water. A remediation system, which operated from 1992 to 1998, functioned to intercept contaminated water at seep locations on the south side of ST41. The four storage tanks were demolished and the piping was removed in 1996 (EAFB, 2003).

The ST41 North Plume consists of POLs from a former one-acre sludge disposal area. Depth to groundwater varies significantly across ST41, with an average depth of about 15 feet bgs and a saturated interval thickness of 13 feet. Although free product has been present at ST41 North in the past, contaminant concentrations have shown a steady decline due to natural attenuation. The plume is estimated to have dimensions of 400-feet by 600-feet. It is upgradient of a natural wetlands area and the site’s ROD requires long-term monitoring to show that natural attenuation continues to be protective of the wetland system (EAFB, 2003).

Exposure to contaminated soil at ST41 is unlikely due to the depth to contamination (greater than 10 feet). Institutional controls restrict access to groundwater and contaminated surface and subsurface solids, as well as groundwater development at the site, as long as hazardous substances remain on the site at levels that preclude unrestricted use. Based on this information, development and improvement of the haul road through the ST41 area should include consideration of on-site contamination. The selected remedy for ST41 is monitored natural attenuation of groundwater, similar to and with the same implications as the groundwater remedy at OU6 (EAFB, 1995).

FT23 Plume (Fire Training Area) is centrally located on EAFB at the northwest corner of the North/South Runway, between Airlifter Drive and 33rd Street. Vertically, it occupies ground water in the shallow aquifer with a depth ranging from 25 to 50 feet. The source of contamination is incomplete combustion of fire training materials in FT23. Contaminants include chlorinated solvent products and hydrocarbons, primarily benzene (EAFB, 2003).

Levels of chlorinated solvents at FT23 must attenuate to below five micrograms per liter (µg/L) in the next three years, to meet the ROD closure date of 2008. If results from

ongoing attenuation sampling at the plume indicate deficient attenuation rates, more aggressive remedial actions may be proposed (EAFB, 2003).

The WP14 Plume is located south of the intersection of 26th Street and the Knik Bluff Trail. The source of contamination is thought to be a valve pit associated with the abandoned PL81 pipeline. It is currently monitored by EAFB using just one well, MW-46. Thus, the dimensions of the plume are not well defined. Ground water at this location is found in a perched aquifer at a depth of approximately five feet bgs (EAFB, 2004c).

The PL81 South Plume, also associated with the PL81 pipeline, is located near the Knik Arm bluff at approximately 45 feet bgs. The plume is approximately 250 feet long, trends east-west, and discharges through a seep at the Knik Arm bluff. Previous investigations determined that the source of this plume was a former pump house associated with the abandoned PL81 pipeline. The dissolved contaminants released from this source migrate westward toward the Knik Arm. PL81 is currently being monitored at one monitoring well and three seep locations (EAFB, 2005b). The potential for plumes to commingle led to the application of OU6 cleanup levels to a 2004 PL81 cleanup project and will be used for all future PL81 projects.

A limited field investigation is currently underway at PL81 South, the old pump house site. Preliminary PetroFLAG data from borings indicate that the plume spread down, encountered isolated clay lenses, pooled on the lenses, flowed off the edges, reached an aquitard (possibly Bootlegger Cove clay), and flowed towards Knik Arm. An accompanying dye test, injected at the site of the pump house, confirms that the plume flows towards the bluff seeps. However, the lateral extent of contamination of the pump house appears to extend to the South/South West between 10 feet to 40 feet bgs.

The ST69 Plume contains a contaminant plume located approximately 1,000 feet southwest of the 26th Avenue and Fairchild Avenue intersection. This is an isolated plume found in the shallow, unconfined aquifer that ranges from 5 to 15 feet thick in this region of EAFB. The source for this plume was a 500-gallon diesel fuel spill, which reportedly occurred between 1989 and 1990. Two monitoring wells are active within the ST69 Plume and are monitored yearly (EAFB, 2003).

SD26 Plume is located near FT23. SD26 (Hangar 14) is an active hangar for C-130s, used for helicopter maintenance, operations, and as a wash rack. The hangar was constructed in 1957 and has been an active facility for over 45 years. Historical records indicate that from 1970 through the early 1980s, waste oil, hydraulic fluids, JP-4, and PD-680 (a petroleum-based solvent used for degreasing) were used at this facility. In 1992, a focused limited field investigation was completed and no further action was required (EAFB, 2005b).

ST32 is a large source area located in the western portion of the base north of Airlifter Drive. Twenty-nine 50,000-gallon fuel tanks were buried, or partially buried, and covered with soil over an 80-acre area along the face and crest of the moraine north of Airlifter Drive and the main East/West Runway. The tanks were manifolded together and gravity fed. In 1982, they were emptied when 11 of the tanks failed a visual inspection. Test results showed no soil contamination; however, petroleum contamination of groundwater

was discovered. The tanks and associated pipeline have been removed. There are monitoring wells still in the area. A decision document, signed in 2003, outlined the cleanup approach of using limited hot spot removal with off-site low thermal desorption for areas within ST32 not meeting closure criteria. The proposed haul road goes directly through ST32 and the proposed crossing at Fairchild Avenue would either be within or near ST32.

LF04 is an old landfill that was used from 1945 to 1957. A groundwater fuel plume encompasses much of the southern area. There is a more limited solvent plume near the center of LF04 South (EAFB, 1997).

Environmental Consequences

Alternative 1: Proposed Action

Less than significant impacts to area ground water are anticipated as a result of mining activities and haul route construction under the Proposed Action.

Mining activities could expose perched water lenses at the North End Borrow Site. Perched water can be situated above discontinuous, fine-grained layers or compacted sediments. Perched water lenses by definition are not resupplied by ground water, and excavating through them would not impact ground water flow.

The removal of overburden, change in slope, and the exposure of gravelly till within the excavation site would locally alter drainage by increasing the rate of soil percolation and impacting runoff rates. Consequently, the rate of recharge for the shallow, unconfined aquifer above the clay layer could temporarily increase at the excavation site. However, annual reclamation plans would incorporate drainage improvements and revegetation would essentially eliminate any standing water and decrease or slow ground water recharge. Average annual precipitation in the Anchorage area totals 17 inches, including snowfall. With implementation of SWPPP measures, the potential impact associated with increased sedimentation is not anticipated to be significant and can be controlled by instituting BMPs.

Four contaminated areas (PL81, ST41, ST32, and ST72) would be crossed by the proposed transportation alignment. There is some risk of encountering contaminated soil and/or groundwater associated with these or other nearby sites. In most cases, this is unlikely since contamination depths exceed proposed disturbance depths. Monitoring wells in the area would be considered during design of roadway improvements. Access to monitoring wells would be provided throughout the project for any required groundwater monitoring activity. Any wells that must be physically impacted during the course of excavation would be discussed with EAFB (3 CES/CEVR) as far as possible in advance of construction activity. Mutual agreement would be reached regarding appropriate actions to be taken, likely to include installation of replacement wells and verification sampling. No significant impact to any of the cleanup remedies is anticipated.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Less than significant impacts to area ground water would be anticipated as a result of mining activities under Alternative 2. The location and method of extraction is the same as in the Proposed Action with the same anticipated effects on drainage and runoff.

Alternative 3: “No-Action”

No significant impacts to ground water would be expected due to excavation and transport from a commercial source. Since excavating soil from a saturated zone is not as easy or efficient as excavating dry material, commercial borrow sources are typically located such that excavation routinely occurs above ground water level. However, the level of impact would be dependent upon the actual source site selected and site specific subsurface conditions that are now unknown.

3.2.3 Vegetation

Affected Environment

BLM manages vegetation in 187 acres of the 255-acre proposed North End Borrow Site. Vegetation within the North End Borrow Site area is a function of localized topography, hydrology, soils, and the types of disturbance. The North End Borrow Site is a mixture of vegetation types ranging from mature birch/spruce forest to middle-aged closed canopy sitka alder to grass meadows and black spruce bogs. Much of the mature spruce has been killed in recent years by beetles and removed through a salvage timber harvest. Understory includes raspberry, currant, bunchberry, horsetail, and high bush cranberry as well as willow, elderberry, rusty menzeiseia, devil’s club, and sapling cottonwood. (EAFB, 2001a) The remaining parcels consist of newly disturbed bare ground and sparsely vegetated sites consisting of roads. Twelve acres of wetlands have been delineated and documented within the project boundary (see Appendix B). Vegetation within these wetlands range from marsh type communities to small patches of freshwater forested shrub wetlands.

Portions of the North End Borrow Site were cleared during the 1940s, when EAFB built the runway. Currently, approximately 20 acres are cleared and are active as borrow material sources. An additional six acres are recovering from previous borrow activities. Surfaces remaining in the abandoned portions of the sand pits are being colonized entirely by indigenous vascular plant species and by lichens (sparse), mosses, and pioneering Scouler willow. In disturbances where fine textured soils remain, indigenous grasses, sedges, and forbs occupy the open ground and introduced species have invaded. Dominating along the trails and road sides is *Calamagrostis canadensis*, also known as bluejoint grass. Bluejoint grass is a native grass species that quickly dominates, especially in moist soils, after being released from competition for sunlight..

The regrowth on overburden heaps to the north of the existing open sand pit is dominated by various grasses and minor numbers of indigenous forb and shrub species. The bare gravel is vegetated primarily by native trees, shrubs, forbs, and lichens (Photo 1). Bare, unvegetated areas of the abandoned borrow pit are present on the south and east facing

slopes, where sloughing has occurred from high walls. Gravel and sand remain relatively loose, providing unstable footing and presumably an unstable substrate for vegetation. A *Floristic Inventory of Vascular Plant Species in EAFB, Alaska* (EAFB, 2001a) determined five rare vascular plant species were found on EAFB, but no threatened, endangered, or candidate species of plant are anticipated in the North End Borrow Site.



Photo 1: Looking south. Shows disturbed bare ground in foreground, and vegetation in background.

Environmental Consequences

Alternative 1: Proposed Action

Less than significant, impacts would occur under the Proposed Action as vegetation is cleared to mine the underlying fill. Removal of wetlands would eliminate associated wetland vegetation as well as the attractant for waterfowl associated with bird aircraft strike hazards. Mitigation would occur to avoid, reduce, or compensate for any adverse impacts from loss of wetland vegetation. This would likely be compensatory or offsite mitigation. Procedures regarding the wetland loss would be addressed in the USAF Finding of No Practicable Alternative (FONPA), the USACE wetland permit, and would meet the requirements of EO 11990. All requirements would be met, with appropriate actions undertaken by MARAD.

The potential for plant communities to re-vegetate the area is very high due to planned re-sloping and re-vegetation after extraction. Annual reclamation plans that include re-vegetation would be implemented after excavation is complete. It is not anticipated that the wetland areas would be graded or revegetated as wetland, but rather with upland species. This would eliminate the current airstrike hazard within the safety area of military aircraft takeoff and landing.

Although overburden replacement is expected as part of each annual reclamation plan, indigenous plant species would reinvade even if site reclamation does not include addition of overburden. The return of upland forest species is usually most easily accomplished by providing a suitable substrate and by allowing natural seed dispersal

mechanisms to reintroduce the trees and shrubs. Natural recovery of vegetation can also occur by recruitment from adjacent sites.

It is understood that EAFB intends to eliminate tall forest types within runway approach zones and convert to tall shrub (primarily willow) moose habitat, including BLM's 187-acre parcel.

Road improvements and widening to create a temporary haul route to the POA would impact trees and other vegetation in direct line of the proposed road site in the short-term (approximately 26 acres). These areas would be revegetated and reclaimed to comply with proposed EAFB land uses upon completion of material removal from the North End Borrow Site for the MTR project.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Less than significant impacts to vegetation are anticipated as a result of mining activities under Alternative 2. Impacts within the excavation site, as well as the reclamation plan for this area, would be identical to Alternative 1. However, less reclamation would be required along the haul route since minimal road improvements would be made.

Alternative 3: "No-Action"

The "No-Action" Alternative would be to acquire material from commercial or non-commercial sites using existing or newly-developed borrow pits. The vegetative consequences would depend upon the location of the source(s) and transportation method selected. Assisted reclamation may or may not be part of a long-term plan at a privately owned site. Indigenous plant species would be expected to reinvade.

3.2.4 Wildlife

The Migratory Bird Treaty Act of 1918 (MBTA), 16 USC. 703-711, last amended in December 1989, is a federal law that enforces international conventions to protect migratory birds. This act also prohibits disturbing a nest once it is established, until it is abandoned. This means that a nesting bird, even if it is a nuisance, typically cannot be disturbed until the nest is vacated. This law includes essentially all species of birds, not just those typically considered migratory (EO 13186).

The Bald and Golden Eagle Protection Act (16 USC. 668-668c) makes it illegal to import, export, or take bald or golden eagles, or to sell, purchase, or barter their parts or products made from them, including their nests or eggs.

Affected Environment

The Anchorage Bowl provides habitat for most of the terrestrial animal species found in south central Alaska. Moose are common and use the proposed project area for calving, summer feeding, fall rutting, and to a lesser extent, wintering.. Black bear are resident in the area, with records of denning nearby. The thick alder habitat is especially attractive for cover and summer and fall food sources. South facing slopes and wetland edges in

the area that green-up early attract black bears in the spring. Moose calves may also provide an important food source. The different berry producing plants, especially devil's club, in years of berry abundance can attract bears from adjacent home ranges in the fall. Brown bears, at 20 to 30 percent of the density of black bears, move from den sites in higher elevations in the Chugach Mountains to feed in and adjacent to the North End project area on many of the same foods as black bears. Wolves from at least one of two packs that use Elmendorf occasionally travel and hunt along the Elmendorf Moraine.

Snowshoe hares, an important food for predators, have a cyclic population and local predators such as lynx, coyotes, red fox, great horned owls and goshawks also cycle with their prey levels. Coyotes are common in the vicinity of the North End site and have denned nearby. Other mammals found in the area are red squirrels, porcupines, short-tailed weasels, voles and shrews. The project boundary habitat wildlife populations are limited by the presence of fencing on the base, as well as human encroachment such as roads, housing, recreational, and military uses.

Wildlife habitat is partially limited at the 255-acre North End Borrow Site because of ongoing disturbance of approximately 20 acres. Tree and shrub species may provide habitat for a variety of birds including songbirds, corvids, raptors, woodpeckers, game birds, and waterfowl. Threatened and endangered species, species of special concern and sensitive species, and their presence on EAFB are addressed in Table 3-8.

There are up to 20 bird species that are year-round residents, and at least 21 migrant species that breed in the Anchorage/EAFB area. Three species of owl (horned owl, saw-whet and boreal owl) breed in the area's forest habitats. Bald eagle, osprey, northern harrier, goshawk, sharp-shinned hawk, merlin, and Harlan's red-tailed hawks are raptors known to nest on EAFB. Thirty-three species of resident and migrant land birds have been documented using forest and shrub habitats during fall season in the Anchorage bowl during migration studies using mist netting and bird banding. The olive-sided flycatcher, gray-cheeked thrush, Townsend's warbler and blackpoll warbler move through the area during fall migration and are included on the State of Alaska's list for Species of Special Concern. The olive-sided flycatcher is a likely nester within the North End site, and the blackpoll warbler is a potential nester.

Moose feed on the abundance of summer forbs within the area. In late summer they strip leaves from shrubs and young trees to include paper birch, willow, aspen, cottonwood/balsam poplar, high bush cranberry, Sitka alder, and mountain ash. In winter they browse on the twigs of the same species but also use rusty menziesia, prickly rose, and devil's club. The low to moderate density of accessible winter browse species within the area result in lower densities during winter months.

Two man-made osprey nesting platforms are located in the North End Borrow Site (Photo 2). No nests were seen upon observation. The platforms were placed along 37th Street to attract osprey away from the trees directly under the flight path. Two pairs of osprey have added material early in 2004 and 2005 to the platform located north of wetland area 1 (see Appendix B), but they eventually nested on communication antennas between Green Lake and Sixmile Creek. Red-tailed hawks nested on the eastern platform

in 2004. There is at least one owl box in the woods just north of 37th Street. It was used by northern saw-whet owls in 2004. The location of these perches can be problematic, given their proximity to the North/South Runway.



Photo 2: Man-made osprey nesting platform near North/South Runway.

Another species of fauna that may be found in the North End Borrow Site and along the POA haul road is the wood frog (*Rana sylvatica*). Auditory population estimates indicate that wood frogs are present in small numbers in all of the North End Borrow Site wetland areas (Griese, 2005). Wood frogs apparently utilize the North End Borrow Site wetland areas during breeding and tadpole periods, which can vary depending on water depth and local temperatures. Breeding periods can range anytime between April 1st and May 25th. At other times of the year, they disperse to surrounding woodlands. Young froglets emerge and disperse from wetlands between late July and mid August. (Griese 2005). Disturbance to wetland areas will be minimized between April and mid-August, when frog populations are most vulnerable and concentrated (Dave Tessler, 2006).

Fish Lake and Triangle Lake are located outside of and within 1,000 feet of the northwest boundary of the North End site. These lakes provide an important recreational resource on EAFB for sport fishing. Both are stocked with rainbow trout by the Alaska Department of Fish and Game.

Environmental Consequences

Alternative 1: Proposed Action

No significant impacts on local populations of wildlife are expected from the Proposed Action. Although habitat would be disturbed during excavation activities in the area, revegetation would occur and habitat would be reestablished. Available data and reports do not identify the presence of any critical habitat in the vicinity of the North End Borrow Site.

Noise generated from the trucks and excavation work may impact resident wildlife such as the wood frog. These animals likely would avoid the area because of associated local noise, similar to those periodically occurring in the area from EAFB use, and loss of

cover and habitat. The brown bear movement corridor may be temporarily restricted during times of disturbance, as would foraging by the black bears. Since the constructed route to transport the material would be temporarily in use for supplying the MTR project, the impacted area may be reclaimed by reestablishing vegetation and habitat, depending on desired long-term land use by EAFB.

The two man-made osprey nest sites appear not to have been recently inhabited. These structures would be demolished during excavation activity.

Clearing of vegetation will cause adverse, but not significant impacts to birds. Vegetation clearing will be conducted outside the of the bird nesting season in accordance with recommendations by US Fish and Wildlife Service to avoid violation of the MBTA. Vegetation clearing/logging will be conducted outside the period of May 1st – July 15th to protect SOSC species such as the Blackpoll warbler, gray cheeked thrush, olive-side flycatcher, and Townsend's warbler, as well as other nesting birds. If owls and raptors are suspected in the area the suggested block extends to April 10th and continues through August 10th (Recommended Time Periods for Avoiding Vegetation Clearing in Alaska to Protect Migratory Birds, USFWS).

Wetland habitat would be removed and not replaced in the interest of reducing bird air strike hazards. Other vegetative habitat would be replaced. Revegetation with intent of providing shrub habitat for moose would be done on an annual basis. Therefore, during the fifth year of excavation activity, the originally mined area would have four-year growth. Mid-term impacts to wildlife would occur before mature vegetation is established. Habitat restoration and reclamation plans would be submitted for approval to MARAD, EAFB, and BLM on an annual basis.

Removal of wetlands and associated habitat currently in close proximity to the runway would decrease the number of birds attracted to the area, thereby reducing the number of birds taken each year for safety reasons. Although a positive impact for military purposes, this would result in an adverse, but not significant, impact for wetland-dependent wildlife. Mitigation would occur to avoid, reduce, or compensate for any adverse impacts. This would likely be compensatory or offsite mitigation. Procedures regarding the wetland loss would be addressed in the FONPA, the USACE wetland permit, and would meet the requirements of EO 11990. Revegetation would be accomplished by methods approved by EAFB. The vegetative cover specified by EAFB is intended to mitigate risks associated with BASH. Overburden recovered from pit development would be incorporated into site reclamation to allow reintroduction of native species. These plans for reclamation would be approved by both MARAD and EAFB as well as comply with state and federal requirements.

Alternative 2: Excavate and Conduct Minimal Road Improvements

No significant impacts to area wildlife are anticipated as a result of mining activities under this alternative. Since the location and mode of excavation is the same as in the Proposed Action, impacts to wildlife would be identical to those resulting from excavation under the Proposed Action. Mitigation would occur to avoid, reduce, or

compensate for adverse impacts resulting from loss of approximately 12 acres of wetlands. Procedures regarding the wetland loss would be addressed in the FONPA, the USACE wetland permit, and would meet the requirements of EO 11990.

No additional short-term impacts to wildlife or their habitat would be anticipated as no road improvement or widening would occur and no habitats would be moved or directly disturbed by usage of existing roads to haul material.

Alternative 3: “No-Action”

Excavating and transporting material from a commercial source would not be expected to have a significant impact on wildlife or their habitat. The temporary disturbance that would occur as a result of this alternative would not likely displace wildlife. However, actual impacts would be dependent upon the source site(s) and the transportation method selected.

3.2.5 Threatened and Endangered Species

The Endangered Species Act (ESA), prohibits the importation, exportation, taking (harassing, harming, capturing, or killing), and commercialization in interstate or foreign commerce of fish, wildlife, and plants that are listed as threatened or endangered species. Under the ESA, all federal departments and agencies must seek to conserve endangered and threatened species and must use their authorities to further the purposes of this act. To this end, they are required to ensure that any and all actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or adversely modify or destroy their critical habitat.

According to the United States Fish and Wildlife Service (USFWS), there are ten animals and one plant on the Threatened and Endangered Species List located in Alaska. Those listed as “Threatened” or “Endangered” in Table 3-8 are on the Federal Threatened and Endangered List. Four additional species of whale are listed as endangered by the National Marine Fisheries Service (NMFS). Only two of the four, the fin whale and humpback whale, occur in Cook Inlet. Both occur in lower Cook Inlet and are considered very uncommon or rare in upper Cook Inlet (APET, 2005). The beluga whale, while not on the endangered species list, is still protected under the Marine Mammal Protection Act and is a candidate species for listing. Beluga whales are found in the upper Cook Inlet.

ADFG maintains a list of Alaska Species of Special Concern (SOSC). An SOSC is any species or subspecies of fish or wildlife or population of mammal or bird native to Alaska that has entered a long-term decline in abundance or is vulnerable to a significant decline due to low numbers, restricted distribution, dependence on limited habitat resources, or sensitivity to environmental disturbance.

BLM also maintains a list of threatened, endangered, or sensitive species for Alaska, including unique plant species. Conditions at the North End Borrow Site are not conducive to the presence of these species, and none are anticipated. If these species are identified during operations at the site, work would be suspended in the identified area, and EAFB staff would be notified.

Affected Environment

Beluga whales (a candidate species) are present in upper Cook Inlet and are addressed in the “No-Action” Alternative discussion below. Neither Alternative 1, the Proposed Action, nor Alternative 2, Excavate and Conduct Minimal Road Improvements, directly impact the marine environment. Other threatened species, endangered species, and SOSC found in Alaska are listed in Table 3-8. Of the listed threatened, endangered, or sensitive SOSC, only the raptors and songbirds are known or suspected to be found on EAFB. It is not documented whether any of those species, including the two suspected nesters, the olive-sided flycatcher and the blackpoll warbler, have had a presence at the North End Borrow Site. EAFB staff has indicated that they know of no occurrence of nests of these two species at the North End Borrow Site, but have not performed specific studies to confirm their absence.

Table 3-8
Threatened and Endangered Species,
Species of Special Concern and Sensitive Species

Category	Common Name	Species Name	Status	Presence on EAFB
Bird	Short-tailed albatross	<i>Phoebastria albatrus</i>	Endangered ^{1,2}	Not anticipated
Bird	Eskimo curlew	<i>Numenius borealis</i>	Endangered ^{1,2}	Not anticipated
Bird	Spectacled eider	<i>Somateria fisheri</i>	Threatened ^{1,2}	Not anticipated
Bird	Stellar’s eider	<i>Polysticta stelleri</i>	Threatened ^{1,2}	Not anticipated
Bird	Olive-sided flycatcher	<i>Contopus borealis</i>	SOSC ^{3,2}	Likely nester*
Bird	Grey-cheeked thrush	<i>Catharus minimus</i>	SOSC ^{3,2}	Migrant*
Bird	Townsend’s warbler	<i>Dendroica townsendi</i>	SOSC ^{3,2}	Migrant*
Bird	Aleutian Canada goose	<i>Branta canadensis leucopareia</i>	SOSC ³	Not anticipated
Bird	American peregrin falcon	<i>Falco peregrinus anatum</i>	SOSC ³	Migrant*
Bird	Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	SOSC ³	Not anticipated
Bird	Northern goshawk	<i>Accipiter gentiles laingi</i>	SOSC ^{3,2}	Yes*
Bird	Rusty Blackbird	<i>Euphagus carolinus</i>	Candidate SOSC ³	Rare*
Bird	Black brant	<i>Branta bernicla</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Black guillemot	<i>Cephus grylie</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Black scoter	<i>Melanitta nigra</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Blackpoll warbler	<i>Dendroica straita</i>	Sensitive Species ²	Suspected nester*
Bird	Black-tailed godwit	<i>Limosa limosa</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Bristle-thighed curlew	<i>Numenius tahitiensis</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	Sensitive Species ²	Not anticipated ⁴

Category	Common Name	Species Name	Status	Presence on EAFB
Bird	Dovekie	<i>Alle alle</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Dusky Canada goose	<i>Branta canadensis occidentalis</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Harlequin duck	<i>Histrionicus histrionicus</i>	Sensitive Species ²	Potential nester* ⁴
Bird	Kittlitz's murrelet	<i>Brachyramphus marmoratus</i>	Sensitive Species ²	Not anticipated ⁴
Bird	King eider	<i>Somateria spectabilis</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Marbled godwit	<i>Limosa fedoa</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Marbled murrelet	<i>Brachyramphus marmoratus</i>	Sensitive Species ²	Not anticipated ⁴
Bird	McKay's bunting	<i>Plectrophenax hyperboreus</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Long-tailed duck	<i>Clangula hyemalis</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Red knot	<i>Calidris canutus</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Red-throated loon	<i>Gavia stellata</i>	Sensitive Species ²	Rare* ⁴
Bird	Surf scoter	<i>Melanitta perspicillata</i>	Sensitive Species ²	Not anticipated ⁴
Bird	Trumpeter swan	<i>Cygnus buccinator</i>	Sensitive Species ²	Migrant, Rare* ⁴
Bird	Tule white-fronted goose	<i>Anser albifrons gambelli</i>	Sensitive Species ²	Migrant*
Bird	Yellow-billed loon	<i>Gavia adamsii</i>	Sensitive Species ²	Migrant*
Mammal	Canada lynx	<i>Lynx canadensis</i>	Sensitive Species ²	Yes*
Marine Mammal**	Fin whale	<i>Balaenoptera physalus</i>	Endangered ^{1,2}	Not anticipated
Marine Mammal**	Blue whale	<i>Balaenoptera musculus</i>	Endangered ²	Not anticipated
Marine Mammal**	Humpback whale	<i>Megaptera novaeangliae</i>	Endangered ^{1,2}	Not anticipated
Marine Mammal**	Bowhead whale	<i>Balaena mysticetus</i>	Endangered ^{1,2}	Not anticipated
Marine Mammal**	North Pacific right whale	<i>Eubalaena japonica</i>	Endangered ²	Not anticipated
Marine Mammal**	Sperm whale	<i>Physeter macrocephalus</i>	Endangered ²	Not anticipated
Marine Mammal**	Sei whale	<i>Balaenoptera borealis</i>	Endangered ²	Not anticipated
Marine Mammal**	Stellar sea lion, western population	<i>Eumetopias jubatus</i>	Endangered ^{1,2}	Not anticipated
Marine Mammal**	Stellar sea lion, eastern population	<i>Eumetopias jubatus</i>	Threatened ^{1,2}	Not anticipated

Category	Common Name	Species Name	Status	Presence on EAFB
Marine Mammal**	Beluga whale	<i>Delphinapterus leucas</i>	Candidate for listing ²	Not anticipated
Marine Mammal**	Harbor seal	<i>Phoca vitulina concolor</i>	Sensitive Species ²	Not anticipated
Marine Mammal**	Northern sea otter	<i>Enhydra lutris kenyoni</i>	Threatened ¹	Not anticipated
Marine Reptile	Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered ^{1,2}	Not anticipated
Marine Reptile	Loggerhead sea turtle	<i>Caretta caretta</i>	Threatened ²	Not anticipated
Marine Reptile	Green sea turtle	<i>Chelonia mydas</i>	Threatened ²	Not anticipated
Fish**	Anagayukaksurak char	<i>Salvelinus anaktuvukensis</i>	Sensitive Species ²	Not anticipated
Fish**	Beaver Creek chinook salmon	<i>Onocorhynchus tshawytscha</i>	Sensitive Species ²	Not anticipated
Fish**	Clear Creek chum salmon	<i>Onocorhynchus keta</i>	Sensitive Species ²	Not anticipated
Fish**	Gulkana steelhead	<i>Onocorhynchus mykiss</i>	Sensitive Species ²	Not anticipated
Fish**	Kigliak char	<i>Salvelinus alpinus</i>	Sensitive Species ²	Not anticipated
Fish**	Western brook lamprey	<i>Lampetra richardsoni</i>	Sensitive Species ²	Not anticipated
Plant	Aleutian shield fern	<i>Polysticum aleuticum</i>	Endangered ²	Not anticipated
Plant	Aleutian wormwood	<i>Artemisia aleutica</i>	Sensitive Species ²	Not anticipated
Plant	Purple wormwood	<i>Artemisia globularia var. lutea</i>	Sensitive Species ²	Not anticipated
Plant	Yellow-ball wormwood	<i>Artemisia senjavinensis</i>	Sensitive Species ²	Not anticipated
Plant	Alaskan glacier buttercup	<i>Beckwithia glacialis spp. Alaskensis</i>	Sensitive Species ²	Not anticipated
Plant	Moonwort	<i>Botrychium ascendens</i>	Sensitive Species ²	Not anticipated
Plant	Ogilvie Mountains springbeauty	<i>Claytonia ogilviensis</i>	Sensitive Species ²	Not anticipated
Plant	Sessile-leaved scurvy grass	<i>Cochlearia sessilifolia</i>	Sensitive Species ²	Not anticipated
Plant	Shacklette's catseye	<i>Cryptantha shackleteana</i>	Sensitive Species ²	Not anticipated
Plant	Bering dwarf primrose	<i>Douglasia beringensis</i>	Sensitive Species ²	Not anticipated
Plant	Aleutian whitlow-grass	<i>Draba aleutica</i>	Sensitive Species ²	Not anticipated
Plant	Tundra whitlow-grass	<i>Draba kananaskis</i>	Sensitive Species ²	Not anticipated
Plant	Murray's whitlow-grass	<i>Draba murrayi</i>	Sensitive Species ²	Not anticipated

Category	Common Name	Species Name	Status	Presence on EAFB
Plant	Ogilvie Mountains whitlow-grass	<i>Draba ogilviensis</i>	Sensitive Species ²	Not anticipated
Plant	Muir's fleabane	<i>Erigeron muirii</i>	Sensitive Species ²	Not anticipated
Plant	Yukon wild buckwheat	<i>Eriogonum flavum</i> var. <i>aquilinum</i>	Sensitive Species ²	Not anticipated
Plant	Narrow-leaved prairie rocket	<i>Erysimum asperum</i> var. <i>angustatum</i>	Sensitive Species ²	Not anticipated
Plant	Calder's bladderpod	<i>Lesquerella calderi</i>	Sensitive Species ²	Not anticipated
Plant	Calder's licorice-root	<i>Ligusticum calderi</i>	Sensitive Species ²	Not anticipated
Plant	Drummond's bluebell	<i>Mertensia drummondii</i>	Sensitive Species ²	Not anticipated
Plant	Arctic locoweed	<i>Oxytropis arctica</i> var. <i>barnedyana</i>	Sensitive Species ²	Not anticipated
Plant	Kobuk locoweed	<i>Oxytropis kobukensis</i>	Sensitive Species ²	Not anticipated
Plant	Alaska bluegrass	<i>Poa hartzii alaskana</i>	Sensitive Species ²	Not anticipated
Plant	Yukon podistera	<i>Podistera yukonensis</i>	Sensitive Species ²	Not anticipated
Plant	Willow	<i>Salix reticulate</i> spp. <i>glabellcarpa</i>	Sensitive Species ²	Not anticipated
Plant	Aleutian saxifrage	<i>Saxifraga aleutica</i>	Sensitive Species ²	Not anticipated
Plant	Mountain avens	<i>Senecio moresbiensis</i>	Sensitive Species ²	Not anticipated
Plant	Pear-shaped candytuft	<i>Smelowskia priformis draba micropetala</i>	Sensitive Species ²	Not anticipated
Plant	Draba Alpina	<i>Draba micropetala</i>	Sensitive Species ²	Not anticipated
Plant	Stipulated cinquefoil	<i>Potentilla stipularis</i>	Sensitive Species ²	Not anticipated
Plant	Nodding semaphoregrass	<i>Pleuropogon sabinei</i>	Sensitive Species ²	Not anticipated
Plant	Pygmy aster	<i>Aster pygmaeus</i>	Sensitive Species ²	Not anticipated
Plant	Hairy lousewort	<i>Pedicularis hirsuta</i>	Sensitive Species ²	Not anticipated

* Studies have not been performed to determine the presence or absence of species specifically at the North End Borrow Site. No occurrence has been noted at the North End Borrow Site and the transportation corridor.

** No marine mammal habitat would be directly impacted by the Proposed Action.

¹ US Fish and Wildlife Service List.

² Bureau of Land Management List.

³ Alaska Department of Fish and Game List.

⁴ Based upon List of Species Found on Elmendorf Air Force Base (EAFB, 1994).

In any case, the MBTA prohibits the harassment of any nesting migratory birds, whether or not they are threatened or endangered. Where there is suspected migratory bird nesting habitat, it is the intention of MARAD that clearing would only occur in non-nesting seasons, as defined by the MBTA. If clearing activity becomes necessary or desirable during the defined nesting season, MARAD would direct performance of reconnaissance actions to identify and protect nest sites as required by the MBTA. Currently, migrating and resident waterfowl are attracted to the wetland areas in the proposed extraction area. As a result, EAFB personnel are currently hazing these birds under the BASH program to decrease the safety risk posed by birds in proximity to a runway.

Only wetland areas 1, 2, 3, and E (see Appendix B) have been observed for the BASH program. These particular wetlands are located close to the North/South Runway. Species observed/harassed within the Proposed Action area with non-lethal actions under the BASH program in 2005 are summarized in Table 3-9.

Table 3-9
Number and Species of Birds Observed/Harassed in 2005

Common Name	Species Name	Count
American Wigeon	<i>Anas Americana</i>	17
Bald Eagle	<i>Haliaeetus leucocephalus</i>	2
Green-winged Teal	<i>Anas crecca</i>	55
Mallard	<i>Anas platyrhynchos</i>	71
Red-tailed Hawk	<i>Buteo jamaicensis</i>	1
Sandhill Crane	<i>Grus canadensis</i>	12
Common Snipe	<i>Gallinago gallinago</i>	2
TOTAL		160

As of October 18, 2005, EAFB recorded three birds of two different species killed under the BASH program at the four monitored wetlands in the North End Borrow Site area. These are listed in Table 3-10.

Table 3-10
Number and Species of Birds Killed in 2005

Common Name	Species Name	Number Killed
Green-winged Teal	<i>Anas crecca</i>	1
Mallard	<i>Anas platyrhynchos</i>	2
TOTAL		3

A point-count breeding bird survey was conducted on EAFB during June 2003 and 2004 to include “point 23”, which is at the western edge of wetland A (See Appendix B). These point counts indicate the birds found at the date and time of the count, and may represent only a fraction of the birds actually present. These are; therefore, examples of what may be found in the area, but are not intended to be an exhaustive list.

- 2003: Four Swainson Thrush; four Myrtle Warbler; and one each of Ruby-crowned kinglet, White-winged crossbill, pine siskin, American robin, black-capped chickadee, northern saw-whet owl; and
- 2004: Four Swainson Thrush; three American Robin; two Slate-colored Junco; and one each Common Redpoll, Ruby-crowned kinglet, White-winged crossbill, and Varied Thrush.

Environmental Consequences

Alternative 1: Proposed Action

No impact to threatened and endangered species would result from implementing the Proposed Action alternative. While several SOSC have been identified as potentially present at the North End Borrow Site and along the transportation corridor, there are no threatened and endangered species known to be present (Table 3-8).

Habitat loss for the Northern goshawk and migrant bird SOSC would not be significant. Similar and higher-value habitat is abundant nearby; the area surrounding the North End Borrow Site is classified by EAFB as “open space” under the military land classification program defining the site a conservation area, forest, or required buffer space. However, as other requirements for EAFB development continue around that vicinity, habitat could decrease, potentially causing negative cumulative effects to these species.

Alternative 2: Excavate and Conduct Minimal Road Improvements

As with the Proposed Action, there would be no impact to threatened or endangered species under Alternative 2.

Alternative 3: “No-Action”

No new environmental consequences are expected for endangered species using this alternative. However, actual impacts would be dependent upon the source site(s) and transportation method selected.

Commercial fill from off site is assumed to come from existing borrow extraction operations. Material moved to the Port by barge is not expected to cause impacts to the Cook Inlet beluga whale population, as belugas appear to be tolerant to frequent passages by larger ships traveling in a consistent direction in summering areas such as Cook Inlet (APET, 2005).

3.2.6 Surface Water

Several federal regulations protect the nation’s water resources. The Clean Water Act requires the implementation of programs to eliminate or reduce pollution of interstate waters and tributaries and to improve the sanitary condition of surface and underground waters. The Wild and Scenic Rivers Act restricts federal agencies from conducting projects that would have a direct adverse effect on designated wild and scenic rivers. The

Fish and Wildlife Coordination Act, as amended, requires agencies to consult with the USFWS and state fish and wildlife agencies where the waters of any stream or other body of water are proposed or authorized, permitted, or licensed to be impounded, diverted, or otherwise controlled or modified.

Impacts to water resources can occur if implementation of an action results in changes to water quality or supply, threaten or damage unique hydrologic characteristics, or violate established laws or regulations.

Affected Environment

The EAFB drainage system provides storm runoff for approximately 80 percent of the urbanized area of EAFB, including most of the North End Borrow Site (PDC, Inc., 2000), and drains through the POA to Knik Arm. This engineered system discharges into Gaylor Gulch along the south side of Cherry Hill housing, traverses down the bluff in an unlined open ditch, is intercepted at the POA and piped underground, and discharges into upper Cook Inlet. This system is separate from the POA systems and does not receive storm water from the POA.

Portions of the EAFB storm water system may be rerouted by EAFB from the existing system to discharge north of Gaylor Gulch. The haul route alignment associated with the Proposed Action creates a grade from EAFB to a potential discharge point into the upper Cook Inlet. This grade and alignment corridor accommodates a future open ditch or underground pipe system that could discharge into downstream controls and diminish discharge into Gaylor Gulch. Construction of a new EAFB drainage discharge system would likely occur after the Proposed Action.

Major natural surface water bodies in the vicinity of the North End Borrow Site include Ship Creek, more than 1.0 mile to the south from the North End Borrow Site. Ship Creek is listed on the 1998 USEPA Section 303(d) list of impaired water bodies due to high levels of fecal coliform, biological community alteration, and petroleum hydrocarbons from urban runoff and industrial activity. No other surface waters within the area are impaired as defined by USEPA (USEPA, 2005).

Due to past extraction activity, there are numerous sloping faces within the North End Borrow Site. Precipitation percolates and runs off as sheet flow into small natural drainage ditches. Local surface water flows southeast until it intercepts the EAFB drainage ditch. See Figure 3 for the drainage surface water map.

Environmental Consequences

Alternative 1: Proposed Action

Adverse, but not significant, impacts could occur as a result of implementing the Proposed Action due to the potential for newly exposed sediment to become entrained in surface water runoff. The impact to surface water would be intermittent, short-term (one operating season at any given location except the transportation corridor) and not significant. Impacts would be minimized through adherence to BMPs and approved storm

water pollution prevention measures. These requirements include providing temporary stabilization on any slopes during construction, and permanent stabilization during the interim and final reclamation phase. Some existing slopes on site are well above the natural angle of repose, creating potential for failure and increased erosion. These slopes would be recontoured to minimize current erosion problems.

Prior to implementing the Proposed Action, MARAD would require operations contractor(s) to identify and implement BMPs to prevent erosion and sedimentation during operation; to control specific onsite erosion and sedimentation; to protect adjacent properties and watercourses from effects related to erosion, sedimentation, and flooding; to control spills; and to handle potentially hazardous materials and waste in accordance with federal, state, and local requirements.

For each year that the site is operated in support of the MTR project, a SWPPP would be prepared according to USEPA regulations and EAFB's SWPPP Guidance for Construction Activities (EAFB, 2004a) and submitted to EAFB for approval prior to any activity on site. SWPPPs would be required from the operations contractor(s), including proof of filing of a Notice of Intent (NOI) to ADEC and USEPA.

Minimal road improvements of up to 26 acres along the existing roadways would have little to no impact on surface water. Roadway maintenance such as grading and watering for dust control would be performed by the selected operations contractor(s) throughout the life of the Proposed Action in order to minimize sediment impact on receiving surface waters.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Similar to Alternative 1, adverse, but not significant, impacts could occur in the excavation area as a result of implementing Alternative 2.

Road improvements of up to eight acres along the existing roadways would have little to no impact on surface water. Roadway maintenance such as grading and watering for dust control would be performed by the selected operations contractor(s) throughout the life of the Proposed Action in order to minimize sediment impact on receiving surface waters.

Alternative 3: No–Action

Because the fill under this alternative would most likely arrive at the POA from established sites and by established thoroughfares, this option would present little threat to surface waters at the North End Borrow Site. No significant adverse impacts to surface water at the North End Borrow Site.

3.2.7 Wetland Resources

EO 11990, *Protection of Wetlands*, precludes federal agencies from leasing space in or undertaking or providing assistance for new construction in wetlands unless no practicable alternative exists. Agencies must also implement all practical mitigation methods to minimize impact to wetlands. For NEPA analyses involving selected

alternatives that could be located in wetlands or floodplains on EAFB, the Air Force is required to prepare a FONPA discussing why no other practicable alternative exists to avoid wetland impacts [32 CFR 989.14(g) and Air Force Instruction (AFI) 32-7064]. Furthermore, projects require USACE permit authorization if they involve the discharge or placement of fill into waters under regulatory jurisdiction, including wetlands.

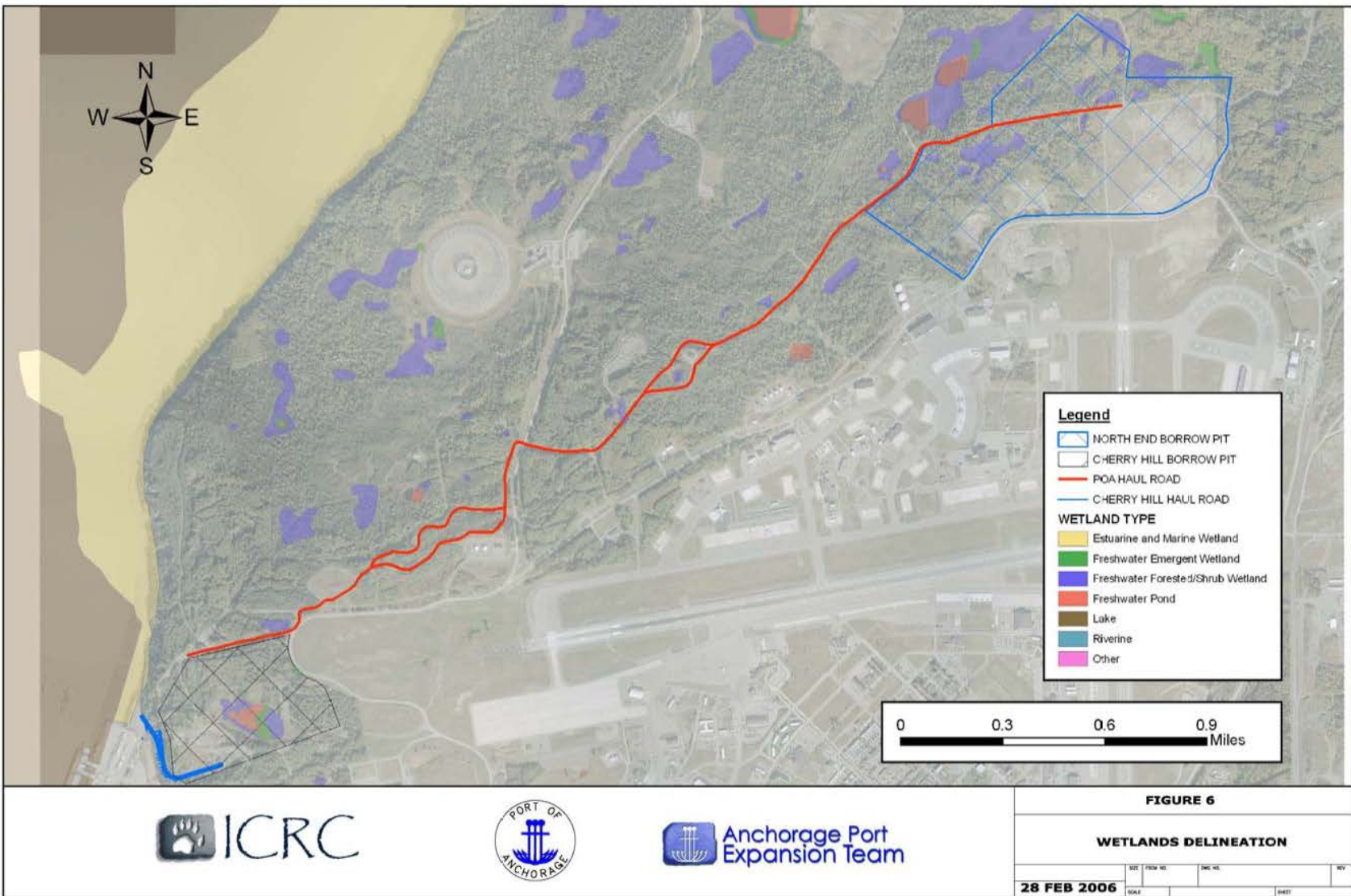
Wetlands are defined by USACE as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands provide fish and wildlife habitat, moderate flood flow, recharge ground water, and protect water quality.

Affected Environment

Twelve acres of wetlands are located within the Proposed Action area. A total of 11 wetland areas have been located. Figure 6 shows the wetlands identified in the USFWS National Wetland Inventory and verified within the North End Borrow Site boundaries during site-specific wetland delineation. The complete Wetland Delineation report is in Appendix B. Note that the planned project boundaries at the time field delineation was conducted were larger than the current Proposed Action boundaries. The excavation limits were subsequently adjusted to provide optimal utilization of terrain and reduce environmental impact on wetlands. Numerous small wetlands are found in the vicinity of the transportation route according to the National Wetland Inventory map of the area, as shown in Figure 6.

Currently, the wetlands act as an attractant to waterfowl, and removal of the wetlands and associated standing water is consistent with the U.S. Air Force BASH program. Removing the wetlands should reduce the ongoing migratory bird depredation take. Five percent of the proposed 255-acre site is wetland. Removal of the wetlands would be irreversible in the local sense.

There are 11 individual wetlands found within the Proposed Area. All of these wetlands have no inlet or outlet, and no moving water is apparent. Each wetland is surrounded by moraines and act as a drainage catchment for ground and surface water from surrounding hills.



The presence of hydrophytic vegetation, hydric soils, and wetland hydrology indicates these areas are regulated wetlands. Photo 3 shows the boggy appearance of a wetland. Photo 4 shows a small lake.



Photo 3: A wetland shown within the North End Borrow Site.



Photo 4: A wetland shown with ponded, open water.

Environmental Consequences

Alternative 1: Proposed Action

Adverse, but not significant, impacts to wetlands would occur as a result of implementing the Proposed Action. The Proposed Action would remove 12 acres of wetland and associated waterfowl habitat. A FONPA would be prepared by EAFB to address Air Force [32 CFR 989.14(g), AFI 32-7064] and EO 11990 requirements for impacts to wetlands prior to implementation of the Proposed Action. Prior to disturbance of any wetlands associated with this action, a USACE wetland permit would be obtained and all requirements stipulated in that permit would be followed.

Removal of the wetland and associated standing water would eliminate the attractant for waterfowl and improve drainage features, reducing bird collision concerns and resulting in a beneficial impact to EAFB operations as bird collisions are EAFB's concern.

Although the loss of the wetlands would not be a significant adverse impact, mitigation would occur to avoid, reduce, or compensate for any adverse impacts. This would likely be compensatory or offsite mitigation. Procedures regarding the wetland loss would be addressed through the USACE wetland permit process.

Numerous small wetlands are found in the vicinity of the transportation route, according to the National Wetland Inventory map of the area. These wetlands were not field verified as part of preparing this EA. However, any wetlands encountered along the transportation route that may potentially be impacted by the project will be identified and evaluated prior to any road building activities in the area. Should any wetlands need to be disturbed as part of road improvement efforts along the transportation corridor, a Nationwide Permit, addressing less than half acre disturbances, would be invoked.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Adverse, but not significant, impacts to wetlands are anticipated as a result of implementing Alternative 2. Wetland impacts would be the same as those identified under Alternative 1. Beneficial impacts to EAFB operations would result from removal of the BASH associated with the wetland. FONPA, EO 11990, and USACE wetland permit requirements would be met. Mitigation would occur to avoid, reduce, or compensate for any adverse impacts, likely as compensatory or offsite mitigation.

Numerous small wetlands are found in the vicinity of the transportation route, according to the National Wetland Inventory map of the area. Should any wetlands need to be disturbed as part of road improvement efforts along the transportation corridor, a Nationwide Permit, addressing less than half acre disturbances, would be invoked.

Alternative 3: "No-Action"

Commercial borrow sites are not typically located in wetland areas; impacts to wetlands at a commercial site are not expected to be significant. However, actual impacts would depend upon the source site(s) selected.

This alternative would not eliminate the standing water at the North End Borrow Site, and birds would continue to be attracted to the habitat. Under the BASH program, wetlands near or within the approach zone may still need to be removed and standing water drained to protect waterfowl and military aircraft pilots.

3.2.8 Other Resources

Prime or Unique Farmlands, Floodplains, or Wilderness Areas are not present at the North End Borrow Site; therefore, no impacts would occur in Alternatives 1 and 2. Under

the “No Action” Alternative, potential impacts to Prime or Unique Farmlands, Floodplains, or Wilderness Areas depend upon the selected source(s).

3.3 HUMAN RESOURCES

3.3.1 Cultural and Historic Resources

Alaska’s cultural resources are protected by several federal regulations. Under EO 11593, *Protection and Enhancement of the Cultural Environment*, federal agencies are required to administer the cultural properties under their control in a spirit of stewardship and trusteeship for future generations. Federal agencies must initiate measures necessary to direct their policies, plans, and programs in such a way that federally owned sites, structures, and objects of historical, architectural, or archeological significance are preserved, restored, and maintained for the inspiration and benefit of the people. Many of the requirements outlined in EO 11593 were systematized in the National Historic Preservation Act of 1996, as amended (NHPA).

At the state level, the State Historic Preservation Office (SHPO) provides assistance in determining cultural significance and eligibility for the National Register. SHPO must be consulted whenever there is a federal undertaking that may affect cultural resources and during development of cultural resources plans. States may also issue regulations designating state historic sites. The Archaeological Resources Preservation Act of 1979 prohibits unauthorized excavation on federal and Indian lands, establishes standards for permissible excavation, prescribes civil and criminal penalties for unauthorized excavation, requires agencies to identify archaeological sites, and encourages cooperation between federal agencies, sovereign tribes, and private individuals.

For this North End Runway Material Extraction EA, tribal entities identified as being potentially interested in excavation activity were sent information and invited to comment. Correspondence is included in Appendix C. SHPO was contacted for information regarding potential historic properties north of the runway and along the road alignment. Other applicable resource agencies were sent information regarding the Proposed Action, and will be sent a copy of this Draft North End Runway Material Extraction EA. This correspondence is included in Appendix D.

Section 4(f) of the Department of Transportation Act of 1966 as amended by 49 USC 303 was adopted to protect the natural beauty of the countryside, public parks and recreation lands, wildlife and waterfowl refuges, and cultural resources. Federally-funded transportation projects requiring use of publicly owned parks, recreation areas, wildlife or waterfowl refuges or historic sites of national, state or local significance (as determined by the federal, state, or local officials having jurisdiction) must demonstrate that no other prudent or reasonable alternatives exist. In addition, the project must adopt all possible planning measures to minimize harm to such locations. If the action would not affect such locations, then no 4(f) regulations apply.

Affected Environment

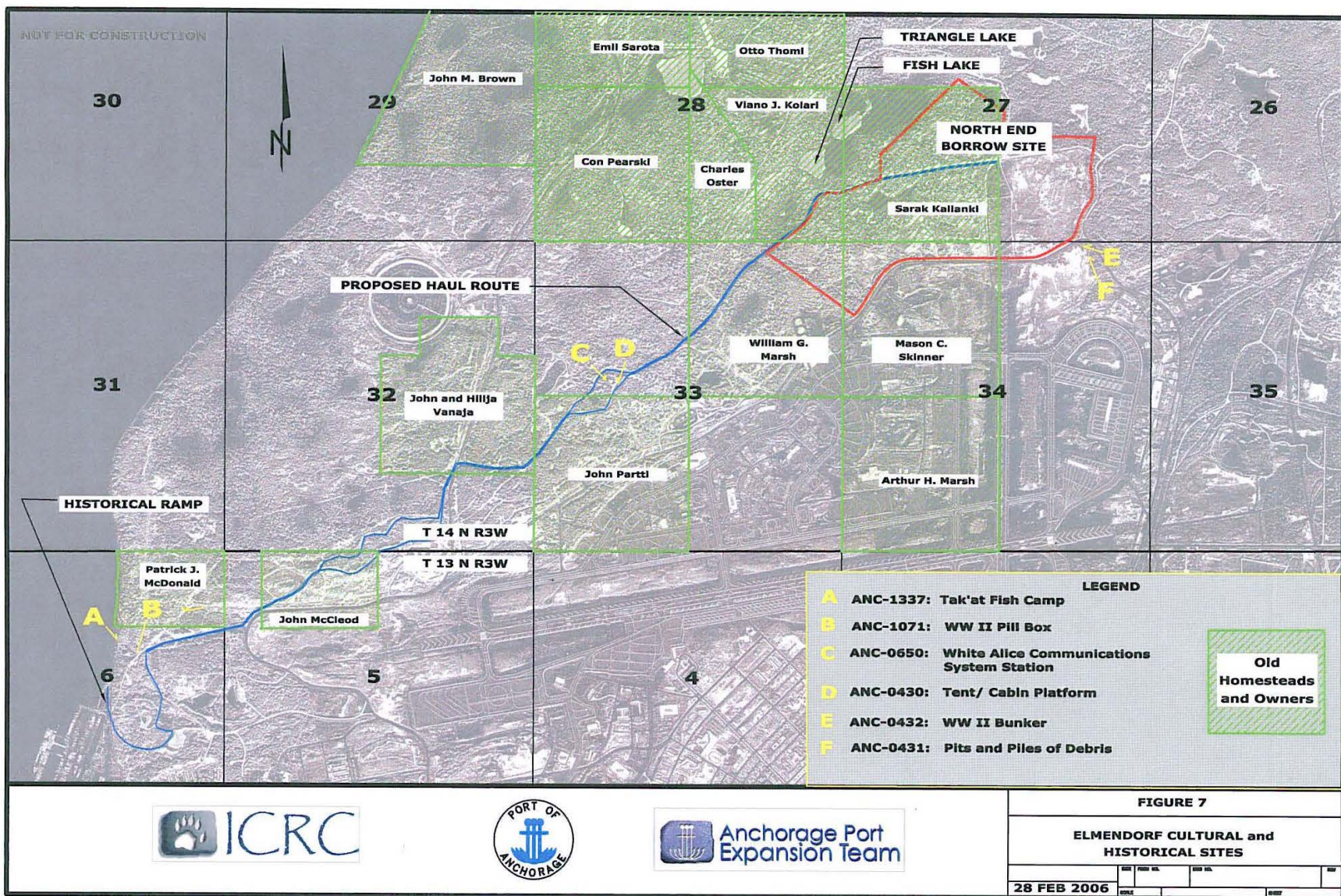
The Alaska Historic Resources Survey (AHRS) lists no archaeological resources or historic properties inside the North End Borrow Site boundary. Two historic properties (ANC-0431 and ANC-0432) are listed in the immediate vicinity of the North End Borrow Site, but neither one is close enough to be directly affected by the proposed excavation (See Figure 7). The first of these sites (ANC-0431) is located just south of Airlifter Drive. The site consists of two shallow pits and two piles of milled lumber and trash most likely associated with the second site, a World War II military bunker (ANC-0432) located approximately 380 yards northward. ANC-0432 consists of a concrete bunker overgrown with alder trees. Approximately ten small rectangular pits appear in a seemingly random fashion throughout the vicinity. The bunker is clearly associated with World War II activities and, perhaps, with a gas line corridor that transects the site.

Four historic resources (ANC-0650, ANC-0430, ANC-1071, ANC-1072, and ANC-1337) are located in the immediate vicinity of the transportation corridor for delivering North End Borrow Site material to the Port; however, none of the four appear to have been impacted by the use of a previously established roadway (See Figure 7).

The first of these sites (ANC-0650) consists of a White Alice Communications System Station constructed in 1956 and includes a small equipment and power building and a microwave relay tower. This unattended communications station is currently owned and operated by Alascom, Inc. The second site (ANC-0430) is located just east of ANC-0650. The site consists of a tent platform or cabin foundation with the remains of a plank floor. Scattered historic debris and cache and privy pits suggest that the site is associated with early homesteading on EAFB. The third site (ANC-1071) is located on a bluff overlooking Knik Arm, a short distance north of the proposed haul route. The site consists of a concrete pill box associated with World War II activities in the area. The fourth site (ANC-1072) abuts the concrete pill box on the same bluff overlooking Knik Arm, a short distance north of the proposed haul route. The site consists of the deteriorating remains of an octagonal anti-aircraft gun emplacement constructed of pre-cast reinforced concrete. This gun emplacement is one of very few remaining World War II anti-aircraft defenses at EAFB. The last of the four sites (ANC-1337) was originally the site of a Dena'ina Fish Camp which was vacated in 1941. The site may have been submerged by the 1964 earthquake. It is considered to be important to members of the Native Village of Eklutna (NVE) and the Knik Tribal Council.

Although the area has not been surveyed, there is a potential for archaeological, historical homesteading, and Cold War military sites in the undisturbed portions of the project area. Based upon information in Paula Daugherty and Becky Saleeby's *Elmendorf Air Force Base Homestead Study* (1998), the North End Borrow Site either approaches or overlaps the properties homesteaded by the following local families between 1914 and 1919: Mason C. Skinner, William G. Marsh, John Partti, John and Hilja Vanaja, John McLeod, and Patrick J. McDonald as shown in Figure 7 (see page 15 of aforementioned work).

During a recent site walk of the North End Borrow Site area, an NVE Elder accompanied by an EAFB staff member discovered four sites believed to be associated with



homesteading. The approximate locations of these sites were noted so that a survey could be conducted to appropriately document these features. It is possible that additional sites similar to the ones identified may be uncovered during surveying, land clearing, and material excavation activities.

Traditional use properties may exist in the area. NVE and Knik Tribal Council members have stated that a historic trail may exist in the vicinity. Two culturally modified trees (CMT) have been identified adjacent to the haul road during a visit by NVE tribal members in November 2005 and more may be present in the area.

Environmental Consequences

Alternative 1: Proposed Action

Although no cultural resources have been recorded within the North End Borrow Site, the area has not been surveyed and at least four archaeological sites and two CMTs are known to be in the area. MARAD will conduct an archaeological inventory of the borrow area and areas adjacent to the haul road, determine the eligibility of any sites to the National Register of Historic Places (NRHP), and mitigate adverse effects to NRHP-eligible sites.

In addition, because background research indicates that the area surrounding the North End Borrow Site shows a medium to high potential for the existence of cultural resources, monitoring for cultural resources would be performed as part of development and operational activities. If, during material extraction and transport, cultural artifacts or suspect cultural artifacts are found, authorities of EAFB and MARAD would be alerted immediately by trained field personnel. This includes any ground-disturbing activity along the proposed transportation route linking EAFB property and the POA. A Cultural Resources Monitoring Plan will be prepared by MARAD which will incorporate applicable components of the April 2003 EAFB Integrated Cultural Resources Management Plan. The site-specific Monitoring Plan will be submitted by MARAD to EAFB and BLM for approval prior to excavation and would be implemented during operations. Identification and mitigation of impacts to CMTs and implementation of the monitoring plan would be coordinated in consultation with the NVE and Knik Tribal Council. In accordance with Section 4(f), all possible planning measures to minimize harm to such locations as well as all significant historic resources would be employed.

With the implementation of these measures, no significant impacts are anticipated to potential cultural resources at the North End Borrow Site or along the haul route. If cultural resources are encountered, impacts would be mitigated in accordance with regulations and SHPO recommendations.

Alternative 2: Excavate and Conduct Minimal Road Improvements

As in the Proposed Action, inventory, eligibility determinations, monitoring, and, if necessary, mitigation to reduce impacts to NRHP-eligible resources would be performed as part of development and operational activities. Similar to Alternative 1, a Cultural Resources Monitoring Plan would be submitted by MARAD to EAFB and BLM for

approval prior to excavation and would be implemented during operations. Identification and mitigation of impacts to CMTs and implementation of the monitoring plan would be coordinated in consultation with the NVE and Knik Tribal Council. In accordance with Section 4(f), all possible planning measures to minimize harm to such locations would be employed. With the implementation of these measures, including avoidance and mitigation of adverse effects to NRHP-eligible resources, no significant impacts are anticipated to cultural resources with Alternative 2.

Alternative 3: “No-Action”

No impact to cultural or historic resources would be anticipated as a result of using an off-site, commercial source. Material would be transported to the POA along established roads, railways, and/or water passage. Because the material would arrive at the POA by established thoroughfares, material transport would present little threat to cultural and historical resources. Potential impacts to cultural and historic resources depend upon the selected sources(s).

3.3.2 Socioeconomics

The social and economic structure of an area is composed of a number of interrelated factors, including population, household characteristics, employment, and personal income. Other contributors to the socioeconomic composition of an area include the availability and cost of housing, the quality of community services, and the types of industries that comprise the economic base.

While there are no directly applicable regulations governing socioeconomics and economic development, the sociological environment may be affected by the Proposed Action if capable of altering economic development (employment and income), population, housing, public health and safety, school enrollment, social services, recreational and community facilities, and visual and aesthetic resources within a region of influence.

Affected Environment

While the main administration and residential complex of EAFB is located in the vicinity of the North End Borrow Site, the social and economic lives of residents and employees in this area are wholly independent of the material excavation area.

Environmental Consequences

The Proposed Action and its alternatives would have a beneficial cumulative effect on socioeconomic resources in Alaska and in the surrounding community. Spending for excavation would result in direct economic stimulus to the local trucking industry and heavy equipment companies. In general, the net cumulative effects of the Proposed Action would increase output and growth in the region, as well as increase employment, income, and consumer spending.

Alternative 1: Proposed Action

No adverse impacts to local socioeconomics are anticipated as a result of implementing the Proposed Action. Areas potentially affected by excavation are military and industrial and are thus separated from residential developments and commercial activities. The aforementioned beneficial economic effects would be equally distributed throughout the local and regional economies.

Alternative 2: Excavate and Conduct Minimal Road Improvements

No adverse impacts to local socioeconomics are anticipated as a result of implementing Alternative 2. Similar to the Proposed Action, areas potentially affected by excavation are military and industrial and are thus separated from residential developments and commercial activities. The aforementioned beneficial economic effects would be equally distributed throughout the local and regional economies.

Alternative 3: “No-Action”

Obtaining fill material from a commercial source would be substantially more expensive than obtaining fill material from the North End Borrow Site. In addition, using a commercial source would shift potential socioeconomic effects to the source location. Benefits would be similar to Alternative 1 except that aircraft safety would not be improved and the hill would not be removed.

3.3.3 Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, issued February 11, 1994, directs federal agencies to take the appropriate and necessary steps to identify and address any disproportionate adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. The essential purpose of EO 12898 is to ensure fair treatment and meaningful involvement of all people; regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulation, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from federal, state, tribal, and local projects and policies.

EO 13045, *Protection of Children from Environmental Health and Safety Risks*, issued April 21, 1997, requires federal agencies to identify and assess environmental health and safety risks that might disproportionately affect children. The order further requires federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. The order defines environmental health and safety risks as “risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest.” These substances include air, food, water, soil, and other natural and manufactured media.

Affected Environment

In 2005 the population of Anchorage was predominantly Caucasian (72 percent), Native Americans (7 percent), African-Americans (6 percent), Asian/Pacific Islanders (7 percent), and Hispanic/Latino (6 percent). The ethnic composition found in Anchorage closely resembles that found across the United States. EAFB is a military establishment.

Environmental Consequences

Alternative 1: Proposed Action

No significant impacts to environmental justice would occur as a result of implementing the Proposed Action. Areas potentially affected by excavation are military and industrial and are largely separated from residential developments.

Alternative 2: Excavate and Conduct Minimal Road Improvements

As with Alternative 1, no significant impacts to environmental justice are anticipated as a result of implementing Alternative 2.

Alternative 3: “No-Action”

In the event that an off-site, commercial source was used to obtain material, the question of environmental justice would shift to the commercial source area and the thoroughfares used to transport the material to POA. Impacts to environmental justice depend upon the selected source(s) and transportation method.

3.3.4 Land Use and Recreation

Affected Environment

Land use in the vicinity of the North End Borrow Site consists of aviation support, military operations, material mining, and undeveloped land which is used for recreation. Recreational use includes occasional walkers, joggers, bicyclists, and all-terrain vehicle riders who use trails and gravel roads through the area in the summer, and cross-country skiers and snow machine riders who use the same trails in the winter. An unpaved pedestrian trail crosses the transportation corridor; this trail connects to the Knik Bluff trailhead with alternative access currently closed and blocked by a security fence. Triangle Lake and Fish Lake, just outside the boundary of the North End Borrow Site, are currently accessed by EAFB personnel and families by way of 37th Street. Alpine skiing is available at Hillberg ski area, northwest of the North End Borrow Site. Hillberg and other nearby lakes and cabins are accessible from Fairchild Avenue.

According to the ADFG sport fish surveys, recreational fishing at Fish and Triangle Lakes consists of the following:

Sport Fishing Effort (Angler Days)

	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>
• Fish Lake	740	943	581	984
• Triangle Lake	310	194	727	799

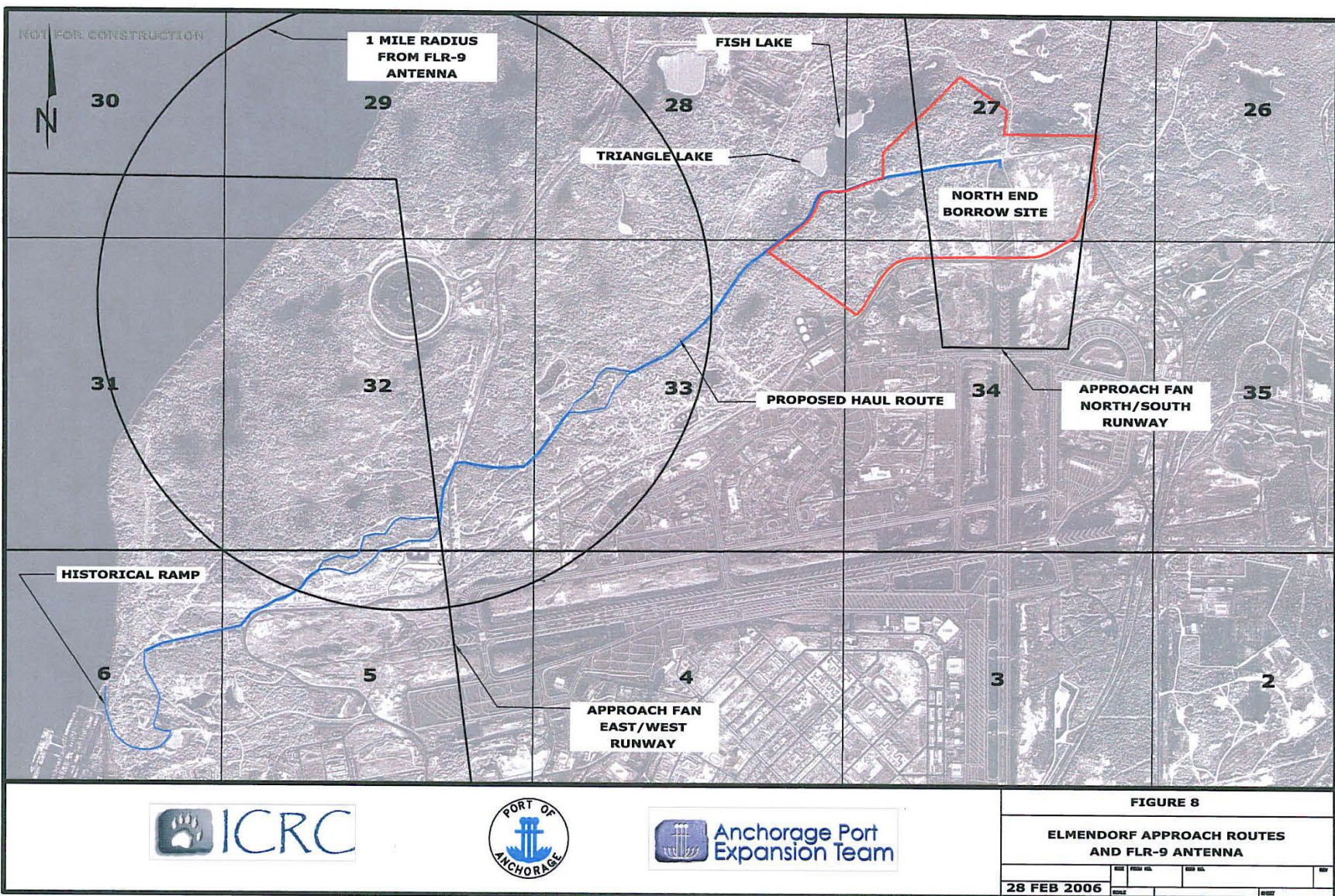
Aircraft safety procedures have been established for all USAF installations limiting land use in some areas on or adjacent to a runway and in a corridor extending out from the end of a runway for 15,000 feet. EAFB has two active runways and approach zones. The North End Borrow Site lies within the approach/departure corridor for the North/South Runway (See Figure 8, page 79). The transportation route described in Alternatives 1 and 2 lies partially within the approach zones for both the North/South and the East/West Runways. According to USAF and Federal Aviation Administration (FAA) requirements, objects within these approach zones exceeding an elevation of 360 feet MSL would protrude into EAFB's aircraft approaches.

DoD Directive 3222.5, "Electromagnetic Compatibility Management Program", is designed to prevent interference between civilian and military use of the frequency spectrum of the FLR-9 antenna located north/and northwest of the North End Borrow Site and northeast of the POA on EAFB (See Figure 8). This directive, restricts construction within 1.0 to 2.0 miles of an electromagnetic source. Per the DoD directive, any construction above the three degree look-angle of FLR-9, calculated to be 276 feet above ground level or 437 feet MSL at 1.0 miles from the antenna, could obstruct reception. The USAF has provided additional guidelines to reduce the possibility of electromagnetic interference (EMI), including: use of low-pressure sodium lighting; shielded or buried power sources; proper maintenance of wireless communications systems and operated above 30 megahertz (MHz); minimal use of equipment, such as arc welders, microwave ovens, switching power relays and ignition-type devices during construction and operation and shielding such equipment from the FLR-9 antenna line of sight at the elevation of 161 feet MSL; and, maximization of the separation distance between the FLR-9 antenna and the location of electrical and electronic devices. Table 3-11 provides minimum separation distances from the edge of the antenna.

Table 3-11
Minimum Separation Distances from FLR-9 Antenna

<i>Standard</i>	<i>Frequency < 30 MHz</i>	<i>Frequency at or above 30 MHz</i>
<i>Federal Communications Commission Standards</i>		
Part 18 RF Lights	0.42 miles (0.7 km)	0.42 miles (0.7 km)
Part 15 Class A	1.38 miles (2.3 km)	2.4 miles (4.0 km)
Part 15 Class B	0.42 miles (0.7 km)	0.42 miles (0.7 km)
Part 15, Subpart C	1.32 miles (2.2 km)	3.84 miles (6.4 km)
Part 18, High Power ISM	9.6 miles (16.0 [line of sight] km)	9.6 miles (16.0 [line of sight] km)
<i>EN Standards¹</i>		
EN 55022 Class A and ISM	0.3 miles (0.5 km)	0.48 miles (0.8 km)
EN 55022 Class B	0.18 miles (0.3 km)	0.24 miles (0.4 km)

¹ EN Standards pertain to European equipment.



Section 4(f) of the Department of Transportation Act of 1966 as amended by 49 USC 303 states that, “The Administration may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site...”. The North End Borrow Site does not contain any significant publicly owned public parks, recreation areas, or wildlife and waterfowl refuges. Therefore, Section 4(f) regulations regarding these resources do not apply. Historic sites potentially located within the North End Borrow Site are addressed in a 4(f) discussion in Section 3.3.1. Access to recreation areas outside the borrow pit boundaries is addressed in the Environmental Consequences sections below.

The Federal Coastal Zone Management Act authorizes a state to review federal activities and federally permitted activities within or affecting the coastal zone. The POA is located within the MOA Coastal District and is governed by the Alaska Coastal Management Program (ACMP) as well as the Anchorage Coastal Management Plan. Projects that occur within the Alaska Coastal Boundary, as defined by the Alaska Coastal Management Act, are subject to a review to determine if they are consistent with the state and local coastal management programs only if certain state or federal permits are required (such as a USACE Section 404 permit). A consistency permit application will be submitted concurrent with the USACE permitting process. Permit issuance would be required prior to implementation of the Proposed Action.

Two permanent structures are located adjacent to the haul route. Both of these buildings support EAFB operations and operate daily. Access to these buildings would be accommodated throughout the life of the Proposed Action.

There are underground facilities adjacent to the Proposed Action. Adjacent to the borrow site there is a natural gas line and fiber optic line that parallels the north side of Airlifter Drive. The boundary of the North End Borrow Site has been set at 100 feet north of the edge of Airlifter Drive to avoid these facilities. The borrow site also has three inactive monitoring wells generally located along the perimeter. The haul route crosses a pressurized sewer line in the vicinity of Fairchild Avenue, and also crosses the EAFB jet-fuel line twice in the area between Fairchild Avenue and 26th Street.

Environmental Consequences

Alternative 1: Proposed Action

Implementation of the Proposed Action would result in less than significant impacts to land use under the Proposed Action.

The alternative pedestrian trail connecting to the Knik Bluff trailhead crosses the haul road. To maintain existing public trailhead access and parking, MARAD will install two stop signs on the trailhead access road on each side where the recreational trail crosses the haul road. This stop-controlled intersection will be cleared to allow adequate sight triangles for safety purposes.

Access to recreational areas from 37th Street would be limited during hauling operations. The road would be heavily posted and its use would be restricted to all but essential

users. Trails in the area would not be as accessible, nor as desirable during excavation and hauling activity. Trails near the excavation would be exposed to noise impacts from construction and would not provide the same current experience of a wilderness setting, interrupted periodically by jet noise. During periods when the existing access roads to Fish and Triangle Lakes are closed for safety reasons, alternative access and parking will be maintained to both lakes. Direct access for government officials to allow stocking of the lakes will be maintained on the haul road with additional safety measures. Full access to the lakes and trails would be reestablished during the reclamation phase and recreational use of this area would be restored at the completion of the Proposed Action.

Access for authorized personnel to the two permanent structures along the access route would be accommodated. Buildings and storage tanks located south of Airlifter Drive are not expected to be impacted by the Proposed Action excavation or transportation activities.

The pressurized sewer line in the vicinity of Fairchild Avenue and the EAFB jet-fuel line between Fairchild Avenue and 26th Street would be crossed by the proposed transport route. Design and construction of any road improvements in this area would accommodate these buried lines to prevent damage.

Personnel and equipment would be within the Clear Zone (CZ) and Accident Potential Zone I during portions of excavation activity. All aircraft safety procedures, guidelines, and communication would be followed during construction and operations. A request for a temporary construction waiver to have personnel and equipment within the CZ would be submitted to EAFB 3 CES, along with all supporting information.

Portions of the EAFB stormwater system may be rerouted by EAFB from the existing system to discharge north of Gaylor Gulch. The haul route alignment associated with the Proposed Action creates a grade from EAFB to a potential discharge point into the upper Cook Inlet. This grade and alignment corridor accommodates a future open ditch or underground pipe system that could discharge into downstream controls and diminish discharge into Gaylor Gulch. Construction of a new EAFB drainage discharge system would likely occur after the Proposed Action.

Alternative 2: Excavate and Conduct Minimal Road Improvements

Minor adverse impacts to land use and recreation are anticipated as a result of implementing Alternative 2. The effects of extraction would be the same as in the Proposed Action, causing limited access along a portion of 37th Street. Trails and lakes near excavation would be exposed to the noise impacts of construction and would not provide the same current wilderness experience, interrupted only by jet noise.

The trails, lakes, and associated access routes would be reestablished during the reclamation phase. Current use of the excavation area would be restored at the completion of the Proposed Action. No long-term impacts to recreation or other land use would occur.

All aircraft safety procedures, guidelines, and separation distances would be followed during construction and operations. MARAD would appoint a contact person available to quickly address potential EMI issues with appropriate military personnel.

Alternative 3: “No-Action”

No impacts to land use at the North End Borrow Site would occur due to excavation and transport from a commercial source outside of EAFB. Full access to Triangle and Fish Lakes, as well as trails in the North End Borrow Site area, would remain open. Under the “No-Action” Alternative, impacts to land use and recreation would depend upon the area(s) selected for borrow material. No conflicts with EMI or aircraft operations would occur.

3.3.5 Impact Reduction Measures

No significant impacts as a result of the Proposed Action were identified. For this reason, no mitigation measures are required to reduce impacts to below significant levels. Precautionary measures, however, would be implemented by MARAD as stewards of natural and cultural resources in order to ensure minimal environmental impact from excavation activities.

MARAD would implement the following actions to minimize potential environmental impacts:

- Mitigation would occur to avoid, reduce, or compensate for adverse impacts due to loss of wetlands. This would likely be compensatory or offsite mitigation. Procedures regarding the wetland loss would be addressed in the FONPA, the USACE wetland permit, and would meet the requirements of EO 11990. The mitigation would focus on converting these wetland habitats into shrub habitats attractive to moose, hares, and other wildlife that pose significantly reduced risk to aircraft.
- As part of requirements for coverage under the Non-point Discharge and Elimination System (NPDES) general construction permit, MARAD would prepare and adhere to a SWPPP.
- A Coastal Zone Consistency Determination has been prepared and submitted to the ADNR for their review and concurrence.
- MARAD will conduct an archaeological inventory of the borrow area and areas adjacent to the haul road, determine the eligibility of any sites to the NRHP, and mitigate adverse effects to NRHP-eligible sites. In addition, because background research indicates that the area surrounding the North End Borrow Site shows a medium to high potential for the existence of cultural resources, monitoring for cultural resources would be performed as part of development and operational activities.

- A Cultural Resource Monitoring Plan has been developed and will be implemented to assure that cultural resources, if found, are appropriately protected.
- USFWS concurrence would be sought to verify that there are no federally listed or proposed species and/or designated or proposed critical habitat within the action area of the project, and that requirements under Section 7 of the ESA have been satisfied.
- Any active monitoring wells damaged or destroyed during the course of excavation would be replaced at the completion of the project.
- BMPs would be followed during mining activity.

4.0 CUMULATIVE EFFECTS, IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.1 CUMULATIVE EFFECTS

The cumulative effects of potential environmental consequences resulting from the incremental impact of the Proposed Action and alternatives, when added to other past, present, and reasonably foreseeable future actions, are presented below. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). Cumulative effects are most likely to arise when a proposed action is related to other actions that could occur in the same location or at a similar time. Actions geographically overlapping or close to the Proposed Action would likely have more potential for a relationship than those farther away. Similarly, actions coinciding in time with the Proposed Action would have more potential for a relationship than those farther away.

To identify cumulative effects, the analysis needs to address three questions:

1. Could resources affected by the Proposed Action interact with resources effected by past, present or reasonably foreseeable actions?
2. If one or more of the effected resources of the Proposed Action and another action could interact, would the Proposed Action effect or be effected by impacts of the other action?
3. If such a relationship exists, are there any potentially significant impacts not identified when the Proposed Action is considered alone?

4.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time in which the effects could occur. This cumulative effects analysis includes the boundaries of the North End Borrow Site and its immediate vicinity, as well as the transportation network between the North End Borrow Site and the POA.

The contribution to cumulative environmental impacts of those consequences judged to involve a potential, even if not significant, impact, is further discussed below.

4.3 EVALUATION OF ACTIONS POTENTIALLY GENERATING CUMULATIVE EFFECTS

MARAD's review of plans, studies, and other documents from the MOA, state, and federal agencies revealed both ongoing and future actions that warranted evaluation for their potential interactions with the Proposed Action. Table 4-1 presents these actions; including actions on EAFB, as identified by EAFB staff.

Table 4-1
Past, Ongoing, and Reasonably Foreseeable Actions Used for Cumulative Effects Analysis

<i>Action</i>	<i>Agency</i>	<i>Timing</i>	<i>Description</i>	<i>Interaction with the Proposed Action</i>
Past				
Airfield Fencing	EAFB	Complete	Security fencing was installed around the EAFB airfield.	Fencing constructed around the airfield contributes to making the wildlife travel corridor between Ship Creek and areas north of EAFB more limited.
Ongoing				
Previous Material Extraction from Sites at the North End of the Runway	EAFB	Ongoing	Excavation of material for use as fill on EAFB construction projects.	Construction materials have been periodically excavated from a portion of the North End Borrow Site for EAFB construction projects. This past excavation has resulted in disturbance of vegetation, wildlife habitat, and surface drainage as well as other resources in the area. Roughly ten percent of the Proposed Action area has been previously cleared for borrow material or runway approach zone safety. Of the 255 acres, approximately 20 acres are actively being mined and 6 acres are recovering from previous use as a borrow site. Noise generation and air emissions would be similar to levels intermittently occurring in the vicinity at the present time. Use of the area as a source for the MTR project would minimize or eliminate use as a source for other EAFB projects. EAFB would eventually require extraction of material from other sites on the base for future projects.
Previous Material Extraction from Cherry Hill	EAFB	Ongoing	Excavation of material for use as fill on EAFB.	Construction materials have been periodically excavated from the Cherry Hill Borrow Site for EAFB construction projects over the last 25 years. This has resulted in disturbance of vegetation, wildlife habitat, surface drainage, as well as other resources in the area, similar to the Proposed Action. At the Cherry Hill Borrow Site, 21 acres remains active and 20 acres are recovering from previous use as a borrow site.
Material Extraction on East Side of Flight Line	EAFB	Ongoing	Excavation of material for use as fill on EAFB.	Fill has been periodically excavated from a borrow site east of the flight line for EAFB construction projects over the last 10 years. Approximately 48 acres have been impacted. This has resulted in disturbance of vegetation, wildlife habitat, surface drainage, as well as other resources in the area, similar to the Proposed Action. The site will continue to be used in the near-term for EAFB fill needs.

<i>Action</i>	<i>Agency</i>	<i>Timing</i>	<i>Description</i>	<i>Interaction with the Proposed Action</i>
POA MTR	MARAD	Proposed for completion in 2011	Expansion and operation upgrades at POA to accommodate additional ships and services.	Proposed Action is in support of the MTR project. Material will be provided directly to this MTR project. If the Proposed Action is not implemented, all material must be provided from more distant sources, creating additional demand on local transportation systems. There will be noise impact from equipment operating at the North End Borrow Site, the haul route and at the POA. However, the sites are remote from critical receptors and will be mitigated by distance. In addition the MTR EA determined potential noise impacts from materials transportation, regardless of the sources, and found the impacts not to be significant.
POA Road and Rail Extension	MARAD	Construction of double track in 2004 and 2005 with third track and final yard by 2011	Extension and widening of Terminal Road and construction of an intermodal rail yard.	Construction of the first two tracks was substantially complete in the fall of 2005. The third track and yard construction could occur simultaneously with the Proposed Action. Operationally, the Road and Rail Expansion will result in reduced truck trips within the Port area and increased rail traffic, reduced CO emissions, and a slight increase in noise to 50 dBA at 1,000 feet. From construction, even with the additional noise contribution, the cumulative noise levels would remain substantially below significant levels.
Various Road Improvements	Anchorage Metropolitan Area Transportation Study (AMATS)	Construction through 2009	Improvements to Whitney Road, Ocean Dock Road, and others.	Improvements should reduce negative effects of long-term growth regardless of Proposed Action (AMATS, 2001). Direct access from EAFB to POA would reduce use of roads targeted for improvement. These sites will create a competing demand for construction materials. That demand will be exacerbated if the MTR project also procures all of the required materials from commercial sources.
POA Harbor Maintenance Dredging	USACE	Annually, May through October	Material is dredged regularly to maintain shipping lanes within the POA harbor.	Fill material from the Proposed Action will be placed within the footprint of current maintenance dredging activities, altering dredging requirements. Since the North End Borrow Site is separated from the dredged area, and impacts terrestrial versus marine resources, the cumulative impacts from the combined projects are not significant. The excess dredged material does not meet the structural requirements of the MTR project fill and must be disposed off-site, although North End Borrow Site material does meet the specifications and can be utilized.

Action	Agency	Timing	Description	Interaction with the Proposed Action
US Army (USAR) Transformation	USAR	Construction 2004-2020	Transformation of the 172 nd Infantry Brigade into a Stryker Brigade Combat Team.	The USAR Transformation Project is focusing on deployment from Army bases remote from the North End Borrow Site. Because this USAR action is primarily associated with remote facilities and deployment actions, there will be very little interaction with the North End Borrow Site, and cumulative impacts will be negligible. The one exception is the potential construction of a military access road to the POA from EAFB. That action is discussed separately below.
Privatizing Housing at Cherry Hill	EAFB	2005-2015	Cherry Hill housing improvements; including basement remodeling to accommodate gas boilers/lines for replacing existing steam heating.	Construction timing would overlap. No net increase in housing area is planned. Construction personnel might use the same EAFB road system to access both work areas. However, it is anticipated that after initial equipment mobilization most heavy equipment associated with the Proposed Action would utilize Port and/or controlled access. Thus, cumulative traffic impacts would not be significant.
Work on Utilities and Infrastructure	EAFB	Started October 2005	Conversion of steam heat to natural gas and demolition of the base power plant.	Emissions from heat generation would be disbursed throughout EAFB instead of being concentrated at the steam plant. This project is at a substantial distance from the Proposed Action, and minimal interaction would occur.
Aircraft Takeoffs and Landings	EAFB	Ongoing	Military aircraft use the adjacent runways for training and air transport.	Aircraft takeoffs and landings cause noise impacts to some of the same surrounding sensitive receptors. The incremental noise levels anticipated as a result of the Proposed Action, however, are negligible compared to existing aircraft noise.
EAFB Monitoring Program for Groundwater Contamination	EAFB	Ongoing	Program to implement monitored natural attenuation remedy for WP14 and LFO4 groundwater contamination areas	Although EAFB mapping indicates contamination sites lie outside of the proposed North End haul route (EAFB, 2004b), there are potentially affected contaminated sites in the vicinity with varying plume extents. To minimize potential for impacts to the ongoing EAFB Monitoring Natural Attenuation Remedy, access to monitoring wells would be provided throughout the North End project for any required groundwater monitoring activity. Any wells damaged or destroyed during the course of excavation would be replaced at project completion. No significant impacts to the operable unit cleanup remedies are anticipated.

<i>Action</i>	<i>Agency</i>	<i>Timing</i>	<i>Description</i>	<i>Interaction with the Proposed Action</i>
Reasonably Foreseeable				
Military Access Road	USAR	Proposed for near future	An access road is being considered in order to provide access between Ft. Richardson and the Port for rapid deployment.	Road alignment would likely be through the North End Borrow Site and along the Proposed Action haul route. Excavation of material in the North End Borrow Site and road improvements along the haul route under the Proposed Action would establish a corridor that could be ultimately used for that road, minimizing future impacts. Thus, by coordinating with EAFB and USAR on the North End Runway Material Extraction Proposed Action, the cumulative impacts associated with the speculative military access road are being minimized and are not significant.
Knik Arm Bridge	Federal Highway Administration (FHWA)	Projected 2006	Construct a vehicle bridge across Knik Arm with its eastern terminus just north of the POA and potential for a roadway along the tidelands or across EAFB property.	Location of roadway could be through EAFB. Bridge concept and roadway access are considered conceptual (FTA, 2003). At least one alternative being considered would cross the North End Borrow Site. However, if that alternative is selected, construction likely would occur after the Proposed Action is completed. If constructed, the Knik Arm Bridge project will create a significant demand for construction fill material within the Anchorage Bowl.
Base Realignment and Closure (BRAC)	EAFB	Timing unknown	Kulis Air Force National Guard base is on the BRAC list and would consolidate with EAFB.	Potential increase in noise, vibration, and emissions from an increase of air traffic. The increased noise would be substantially greater in volume than noise from the Proposed Action.
Rerouting of Storm Water Out of Gaylor Gulch	EAFB	Timing unknown	Existing underground storm water that is currently discharged openly from an outfall into Gaylor Gulch may be rerouted and/or encased into a closed system elsewhere along the boundary between EAFB and POA.	Portions of the EAFB storm water system may be rerouted by EAFB from the existing system to discharge north of Gaylor Gulch. The haul route alignment associated with the Proposed Action creates a grade from EAFB to a potential discharge point into the upper Cook Inlet. This grade and alignment corridor accommodates a future open ditch or underground pipe system that could discharge into downstream controls and diminish discharge into Gaylor Gulch. Construction of a new EAFB drainage discharge system would likely occur after the Proposed Action.
F/A – 22 Operational Wing Beddown	EAFB	First squadron proposed to arrive in 2008.	24 F/A-22 type airplanes will be added to the North-South Runway for drill use.	The Environmental Assessment for this action has just been recently initiated and information is not yet available to evaluate the cumulative impacts of this action in reference to the North End Borrow Site EA.

<i>Action</i>	<i>Agency</i>	<i>Timing</i>	<i>Description</i>	<i>Interaction with the Proposed Action</i>
Cherry Hill Borrow Site Material Extraction and Transport	MARAD	Proposed to begin 2006, could take over four to five years to complete	Use of an area to provide up to 3.3 million cubic yards of additional fill material for the MTR project. This would result in a potential total removal of 11.8 million cubic yards of construction material from EAFB for the MTR project.	If this action were to advance, the North End Borrow Site and this site would be operated concurrently as a single source of materials. Independently, this reasonably foreseeable action would result in clearing of additional vegetated areas on a short-term (one to three years for any given area) basis, with a similar short-term impact on wildlife vegetation. In addition, the action would result in additional truck movement through the Cherry Hill access corridor to the Port. This traffic would be in lieu of transportation of materials to the Port from other commercial or non-commercial sources. Either action could stand alone and has independent utility.

4.4 ASSESSMENT OF CUMULATIVE EFFECTS

The Proposed Action would affect air quality, noise, water resources, geology, vegetation, and wildlife. These resources would also be affected by other projects that overlap in time and/or space. Further assessment of the cumulative nature of impact to these resources is given below. Most of the impacts are short-term in nature. Impacts to air quality and noise, for example, would occur during excavation activity, but would come to an end when excavation stops. Impacts to vegetation and wildlife habitat would also occur during excavation, but would be mitigated in the long-term by revegetation and reclamation of the entire site. Mid-term impacts will occur while vegetation reestablishes, however, these impacts are not anticipated to be significantly adverse or long-term. Irreversible commitment of resources is discussed in Section 4.5.

Air Quality. Several construction projects would overlap during the construction window, but cumulative emissions would not be regionally significant. Many of the construction and operational phases of these projects would increase vehicle traffic along the road network for the POA and EAFB, resulting in a temporary increase in emissions. However, the long-term impact of some projects, such as the POA road and rail extension which will allow for cargo to be transferred directly between rail and barge, will result in reduced truck traffic and corresponding air emissions.

The sources of airborne pollutants resulting from implementation of the Proposed Action would be operation of extraction equipment, loading and offloading dump trucks, and trucks hauling material between the pit and the fill point. The contribution of emissions from material hauling would depend on both the volume of material transported and the total vehicle mileage traveled.

The effects of simultaneous operation of the Cherry Hill and North End Borrow Sites have been calculated based on the schedule of cubic yards of various types of material needed to complete the project. The phased approach of removing material only from Cherry Hill in the year that the road to the North End Borrow Site is constructed means that the largest extraction years for the two sites are different years. The CO emissions for

the year of maximum emissions, 2007, are 94.37 tons of CO and 49.33 tons of PM₁₀. Airborne pollutants produced by material extraction and hauling equipment include emissions of carbon monoxide, sulfur dioxide, nitrogen oxides, volatile organic compounds (e.g., reactive hydrocarbons), and particulate matter. Gasoline and diesel-powered vehicles traveling on roads emit many of these same pollutants, in addition to causing an increase in short-term ambient dust levels along the transportation corridor.

Road dust may interfere with plant respiration, and has been associated with major increase in the pH of the organic layer. To mitigate potential impacts, the operations contractor(s) would implement BMPs and dust control, such as watering and/or application of dust palliatives and particle binders to the road surface to reduce impacts to less than significant levels.

Although activities associated with the material acquisition plan might cause short-term and localized degradation of air quality, the impact would not be significant in the context of the overall air quality. Also, because of the relatively isolated location of the site and direct EAFB to POA access, these emissions likely will not occur in areas where other identified projects are causing similar emissions.

The net impacts of other planned projects to air quality impacts would be less than significant, since most emission sources would be mobile and intermittent in nature, and their resulting pollutant impacts would not be large enough in the localized area to cause an exceedance of any ambient air quality standard. Therefore, when compared with existing baseline conditions, no significant cumulative adverse impacts to air quality would occur.

Noise. Site development and operational noise from material excavation at the North End Borrow Site would not have significant adverse impacts on sensitive receptors. Cumulative construction, dredging, and operations projects would result in additional short-term increases in noise levels. Thus, temporary increases in localized noise from construction and excavation equipment and related vehicles would be expected. However, the Proposed Action effects would only overlap with projects occurring in the same timeframe and general area, primarily the MTR project. The combined impacts of these actions would remain well below the threshold of significance and would not be anticipated to have a significant cumulative impact on the neighboring noise-sensitive land use areas.

The largest noise impact in the area is from aircraft takeoffs and landings. The North End Borrow Site is located less than 0.25 miles from the North/South Runway at its closest point. The noise from jet takeoffs and landings is 110 dBA, which far exceeds the noise level of trucks and excavating equipment. The type of noise generated from construction activities is different than the intense short-burst noise generated by military aircraft. Construction activity noise from all potential sources would be attenuated by distance and topography before reaching sensitive receptors.

The estimated noise values for the Proposed Action activities fall below USEPA's criteria for a significant impact due to noise generated by construction at sensitive receptors (65

dBA) and the Anchorage noise ordinance prohibiting construction noise above 80 dBA in residential areas.

Water Resources. There are several wetland areas within the North End Borrow Site. If the proposed action is implemented, there is a possibility that some or all of the wetland areas would be removed during the process of excavating. However, EAFB could potentially remove or substantially modify the wetlands under the BASH program at any time.

If determined appropriate during the USACE permitting process, wetland mitigation to counteract the impact of losing wetland function will be implemented for construction activities.

Geology and Soil. Pertinent issues associated with geologic resources include the need for long-term availability of borrow source material and the potential for accelerated erosion. Strategically located borrow sites should not be exhausted in the short-term because they may be needed over the long-term. In addition, extraction activities could accelerate erosion and increase sedimentation to surface waters.

Disturbed areas within the active extraction site would be subject to potential erosion during the interval between vegetation clearing and site restoration. The mining plan for the site would include provisions to limit erosion and control surface runoff during the active operating period, and operational monitoring would include erosion and related resource protection concerns. All mined areas would be revegetated after operations are complete.

Vegetation, Habitats, and Wildlife. Short-term (one growing season) and mid-term (two to three growing seasons) losses to vegetation would occur on the North End Borrow Site due to ongoing extraction and construction operations. However annual reclamation and revegetation activities will help to replace the vegetation and wildlife habitat resources, and will minimize the total acreage impacted at any one time. Many of the potentially effected species are associated with habitats previously degraded and/or reduced in size due principally to historical activities. In addition, operational noise and other activity from the adjacent runway area and aircraft overflights already impact wildlife use. Other EAFB projects in the areas will also impact vegetation and wildlife habitats, such as removal of habitat under the BASH program. However, given the location, isolated area of disturbance, and the fact that the area would be revegetated, there are no significant additional cumulative impacts to the vegetation and wildlife from the Proposed Action.

4.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable

timeframe. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or a cultural resource).

For the Proposed Action, those resources that involve an irreversible or irretrievable commitment are:

- Extraction of 9.8 million bank cubic yards of fill from North End Borrow Site.
- Removal of existing wetlands. Removal would be accomplished after completion of the USAF FONPA and USACE wetland permitting processes, with mitigation measures as applicable following the assessment. Mitigation would likely occur as compensatory or offsite mitigation.
- Use of various non-renewable petroleum products for trucks, vehicles, loading/offloading equipment, trains, and building equipment. The increase in the use of these products would be minimal during construction compared to their availability. The Proposed Action would reduce the amount of non-renewable fuel used due to the decrease in transport distance into the MTR project limits.

Most other resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary.

5.0 REFERENCES

- Anchorage Metropolitan Area Transportation Study (AMATS). 2001. *Freight Mobility Study for the Anchorage Metropolitan Area*. Municipality of Anchorage.
- Anchorage Port Expansion Team (APET). 2004. *Port of Anchorage Road and Rail Environmental Assessment*.
- _____. 2005. *Final Port Intermodal Expansion Project, Marine Terminal Redevelopment Environmental Assessment*. March 2005.
- _____. 2006. *Cherry Hill Material Extraction and Transport Final Environmental Assessment*. January 2006.
- Antonson, Joan M. 2005. Correspondence. Subject: North End Gravel Extraction, Anchorage. To Michael Carter, Director, Office of Environmental Activities, USDOT Maritime Administration.
- AP 42, Fifth Edition. *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*. Chapters 3, 11.
- Carberry, Michael E. 1979. *Patterns of the Past: An Inventory of Anchorage's Heritage Resources*. Prepared for the Municipality of Anchorage, Historic Landmarks Preservation Commission.
- Code of Federal Regulations (CFR), *Title 14 - Aeronautics and Space, Chapter I - Federal Aviation Administration, Department of Transportation, Subchapter E - Airspace, Part 77 - Objects Affecting Navigable Airspace*.
- Cook, Linda. 1999. *Elmendorf Air Force Base: Historic Context of World War II Buildings and Structures. Volume I*. National Park Service.
- _____. 1997. *Elmendorf Air Force Base: Historic Context of World War II Buildings and Structures. Volume II*. National Park Service.
- Daugherty, Paula M. and Becky M. Saleeby. 1998. *Elmendorf Air Force Base Homestead Study*. National Park Service, Alaska Support Office, Anchorage, Alaska.
- Elmendorf Air Force Base (EAFB). 1993. *EAFB Air Installation Compatible Use Zone Study*.
- _____. 1994. *Environmental Assessment, Elmendorf Air Force Base Gravel Pit Expansion*. Contact: John Mahaffey.
- _____. 1995. *Operable Unit 2 Record of Decision*.
- _____. 1996. *SD-15 Treatability Study Excavation Report, Operable Unit 6*.

- _____. 1997. *Operable Unit 6 and Source Area SS19 Record of Decision*.
- _____. 2001a. *A Floristic Inventory of Vascular Plant Species on EAFB, Alaska*.
- _____. 2001b. *Environmental Restoration Program, Management Action Plan*.
- _____. 2001c. *Establishment and Characterization of Long-term Monitoring Sites on EAFB, Alaska*.
- _____. 2003. *Basewide Groundwater Monitoring Report*.
- _____. 2004a. *EAFB SWPPP Guidance for Construction Activities*.
- _____. 2004b. Environmental Restoration Program. 2003 Annual Report, Basewide Groundwater Monitoring Program. May 2004.
- _____. 2004c. *OU6 EAFB Environmental Fact Sheets*, 3 CES/CEV.
- _____. 2005a. *Annual Technical Report Environmental Monitoring and System Optimization of SD15 High Vacuum Extraction System*.
- _____. 2005b. *2004 Phase I RPO Annual Report, Groundwater Performance Optimization Monitoring Program, EAFB*, Volume I of III.
- Fall, James A., Nancy Yaw Davis, and The Dena'ina Team. 2003. *An Overview of Dena'ina Athabascan Uses of Sites on and near Elmendorf Air Force Base, Alaska*. Prepared for US Army Corps of Engineers.
- Federal Transit Administration (FTA). 1995. *Noise and Vibration Impact Statement*. Accessed via <http://ntl.bts.gov/data/rail05/rail05.html>.
- Hollinger, Kristy. 2001. *Homesteads on Fort Richardson, Alaska*. Prepared by Center for Ecological Management of Military Lands and Russell H. Sackett of Natural Resources Branch of US Army Alaska.
- McMahan, J. David and Charles E. Holmes. 1996. *Archaeological Survey of Elmendorf Air Force Base, Alaska: Final Report*. Office of History and Archaeology Report Number 61.
- PDC, Inc. 2000. *Cherry Hill Ditch Erosion Control Feasibility Study*.
- Shaw, Robert D. 2000. *Historic Properties and Paleontological Resources Survey for Realignment of the Alaska Railroad Corporation Tracks across Elmendorf AFB and Fort Richardson, Alaska*. A report from Robert Shaw Enterprises under contract to Tryck Nyman Hayes, Inc.
- Terracon Consultants, Inc. 2005a. *North End Borrow Site Reclamation Plan, Port of Anchorage Expansion, Anchorage, Alaska*.

- _____. 2005b. *Source Evaluation Report, Elmendorf Air Force Base Evaluation Program, Port of Anchorage Expansion*. Anchorage, Alaska.
- _____. 2005c. *Report of Material Transport, Elmendorf Air Force Base Routing North Backlands Expansion, Port of Anchorage Expansion*, Anchorage, Alaska.
- _____. 2005d. *Storm Water Management Report for Port of Anchorage Expansion North Backlands Expansion*, Anchorage, Alaska.
- University of Alaska, Anchorage, *Wood Frog Factoids*. http://aknhp.uaa.alaska.edu/herps/pdf/spec_acct_wood_frog.pdf.
- US Air Force. 1994. *Environmental Assessment Elmendorf Air Force Base Gravel Pit Expansion*. Contact: John Mahaffey.
- US Fish and Wildlife Service, *Advisory: Recommended Time Periods for Avoiding Vegetation Clearing to Protect Migratory Birds*. Bulletin. 2006.
- _____. 2001. *Basewide Institutional Controls, Wing Instruction 32-1007*.
- US Department of Transportation (USDOT). 1980. *Noise Fundamentals Training Document, Chapter 2, Highway Noise Fundamentals, and Chapter 3, Highway Traffic Noise Sources*.
- US Environmental Protection Agency (USEPA). 2005. *Region 10 Watershed Characterization Summary Maps, 303(d) listed waters*, <http://www.epa.gov/Region10/maps/clrwtr.html>.

6.0 PERSONS AND AGENCIES CONTACTED

Judith Bittner, Deputy State Historic Preservation Officer, Office of History and Archaeology

Connie Burnell, Native Village of Tyonek

Kevin Cramer, Airfield Manager, Elmendorf Air Force Base

Joan Dale, Office of History and Archaeology, State Historic Preservation Office

Richard G. Encelewski, Ninilchik Traditional Council

Gary Fink, Environmental Scientist, Elmendorf Air Force Base

Paula Fowler, Air and Water Program Manager, Elmendorf Air Force Base

Ellen Godden, Environmental Planner, 3 CES/CEVP, Elmendorf Air Force Base

Roger Graves, Manager Government/Environmental Affairs, Port of Anchorage

Herman Griese, Wildlife Biologist, Restoration, 3 CES/CEVP, Elmendorf Air Force Base

Don Kashevaroff, Selodvia Tribal Village

Anne Lawton, Cultural Resource Planner, 3 CES/CEVP, Elmendorf Air Force Base

John Mahaffey, Contaminated Sites Project Manager, Elmendorf Air Force Base

Valerie Payne, Community Planner, 3 CES/CEVP, Elmendorf Air Force Base

Rick Pearce, Division Manager, Terracon Consultants, Inc.

Gary Reimer, Field Manager, Bureau of Land Management, Anchorage Field Office

Gregory J. Schmidt, Chief Environmental Planning, 3 CES/CEVP, Elmendorf Air Force Base

Rita Smagge, Kenaitze Indian Tribe

Lee Stephan, Native Village of Eklutna

Dave Tessler, Alaska Fish and Game Department of Wildlife Conservation

Carol Theodore, Knik Tribal Council

Douglas Wade, Native Village of Chickaloon

Hazim Yunis, Project Manager, 3 CES/CEVP, Elmendorf Air Force Base

7.0 LIST OF PREPARERS AND CONTRIBUTORS

Timo Allen, Clarus Technologies, LLC
B.A., University of Alaska, English, 1995
B.A., University of Alaska, History, 1996
M.A., University of Alaska, Northern Studies, 2002
Years of Experience: 10

Janet Bartel P.E., Clarus Technologies, LLC
B.S., Petroleum Engineering, Colorado School of Mines, 1981
M.S., Environmental Engineering, University of Alaska, 1994
Years of Experience: 21

Diana Brake, Program Manager, Integrated Concepts & Research Corporation
B.S., Civil Engineering, University of Idaho, 1995
Years of Experience: 15

Laurie Butler, Environmental Manager, Integrated Concepts & Research Corporation
B.S., Resource Conservation, University of Montana, 1991
M.S., Environmental Science, Alaska Pacific University, 1997
Years of Experience: 15

Chuck Casper, P.E., Senior Engineer, Integrated Concepts & Research Corporation
B.S., Civil Engineering, University of Alaska, 1987
Years of Experience: 18

Nicholas R. Henegan, P.E., P.G., Senior Engineer, Integrated Concepts & Research Corporation
B.S., Geology, University of Vermont, 1982
M.B.A., Business Administration, Campbell University, 1990
M.S.E., Civil Engineering, Arizona State University, 1993
Years of Experience: 23

Leigh High, Clarus Technologies, LLC
A.A.S., Broome Community College, Engineering Science, 1993
B.S., State University of New York at Cortland, Geology, 1995
M.S., Binghamton University, Geological Education, 2000
Years of Experience: 5

Bill Humphries, Vice President, Integrated Concepts & Research Corporation
B.A., Environmental Management, University of North Carolina, 1977
M.S., Watershed Science, Utah State University, 1981
Years of Experience: 24

Dana C. Novak, TEC, Inc.
B.S., Environmental Science, Ohio State University, 1997
Years of Experience: 7

Theresa Rudolph, Project Manager, TEC, Inc.
B.A., Anthropology, Florida State University, 1975
M.A., Anthropology, Southern Illinois University, 1981
Years of Experience: 24

Catherine Steen, CHMM, Clarus Technologies, LLC
B.S., Chemistry, George Washington University, 1983
M.A., Management, Webster University, 1993
Years of Experience: 23

Appendix A

Public Involvement

RESPONSE TO PUBLIC REVIEW COMMENTS
NORTH END RUNWAY MATERIAL EXTRACTION AND TRANSPORT
DRAFT ENVIRONMENTAL ASSESSMENT
5-5-2006

From	Topic	Comments	Response
Cook Inlet Keeper	NEPA General	CEQ regulations require that an agency must consider cumulative impacts when undertaking a NEPA analysis---including those impacts arising from all past, present and reasonably foreseeable future projects. The cumulative impacts of all phases of POA project are significant, and their existence demonstrates that the POA project is a major federal action significantly affecting the environment for the purposes of NEPA's EIS requirement.	MARAD assessed the effects of Cumulative impacts in Chapter 4 of the North End Material Extraction and Transport Draft EA. A detailed list of the effects of the Proposed Action on those projects is summarized in Table 4-1.

Appendix B

Wetland Delineation



Clarus Technologies
A Subsidiary of Koniag, Inc.

September 28, 2005

Ms. Laurie Butler
Environmental Manager
Integrated Concepts and Research Corporation
Infrastructure Support Service Division
421 West First Ave., Suite 200
Anchorage, Alaska 99501

Subject: Wetlands Delineation Report - North End Gravel Extraction Area, Elmendorf Air Force Base, Anchorage, Alaska

Dear Ms. Butler:

The purpose of this report is to present results from the on-site wetland delineation conducted at the North End Gravel Extraction Area, Elmendorf Air Force Base (EAFB) within the North End Borrow Site boundaries. Attached to this report are the map (Attachment 1), data sheets (Attachment 2), photographic log (Attachment 3) that the US Army Corps of Engineers (USACE) require to complete a wetland delineation and jurisdictional determination.

Clarus appreciates this opportunity to support ICRC in the Port Expansion project. Please let us know if you have any comments or questions or need any further information.

Sincerely,
CLARUS TECHNOLOGIES, LLC

A handwritten signature in black ink, appearing to read "Catherine Steen", written over a horizontal line.

Catherine Steen
Project Manager

Attachment 1: Extent of Wetlands and Areas Studied
Attachment 2: Data Sheets (22 pages) – All areas
Attachment 3: Photographic Log

cc: Bill Humphries

Port of Anchorage
Intermodal Expansion Project

Wetlands Delineation Report
North End Gravel Extraction Area
Elmendorf Air Force Base, Anchorage, Alaska

September 2005

CLARUS TECHNOLOGIES, LLC



Catherine Steen, CHMM
Compliance Specialist



Clarus Environmental Services, LLC
11901 Business Blvd, Suite 105
Eagle River, Alaska 99577

Table of Contents

SECTION 1: INTRODUCTION	1
1.1 Site Visits	1
1.1.1 Area 1 Observations	2
1.1.2 Area 2 Observations	3
1.1.3 Area 3 Observations	4
1.1.4 Area A Observations	5
1.1.5 Area B Observations	6
1.1.6 Area C Observations	7
1.1.7 Area D Observations	8
1.1.8 Area E Observations	9
1.1.9 Area F Observations	10
1.1.10 Area G Observations	11
1.1.11 Area H Observations	12
1.1.12 Area I Observations	13
SECTION 2: SUMMARY	15

Tables

Table 1: Area 1 Plant Species Identified
Table 2: Area 2 Plant Species Identified
Table 3: Area 3 Plant Species Identified
Table 4: Area A Plant Species Identified
Table 5: Area B Plant Species Identified
Table 6: Area C Plant Species Identified
Table 7: Area D Plant Species Identified
Table 8: Area E Plant Species Identified
Table 9: Area F Plant Species Identified
Table 10: Area G Plant Species Identified
Table 11: Area H Plant Species Identified
Table 12: Area I Plant Species Identified

Appendices

Attachment 1: Extent of Wetlands and Areas Studied
Attachment 2: Data Forms
Attachment 3: Photographic Log

Section 1: Introduction

Recognizing the potential for continued or accelerated degradation of the Nation's waters, the US Congress enacted the Clean Water Act, formerly known as the Federal Water Pollution Control Act (33 USC 1344). The objective of the Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands.

The US Army Corps of Engineers (USACE) [47 Federal Register (FR) 31810] and the US Environmental Protection Agency (EPA) (45 FR 85352 - 85353) jointly define wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

The 1987 Corps of Engineers Wetlands Delineation Manual (the Manual) describes the following general diagnostic environmental characteristics and technical approach which provides a guideline for the identification and delineation of wetlands:

- Vegetation adapted to areas having hydrologic and soil conditions typical to wetlands. For the purposes of this report, as required by the Manual, the measure of this characteristic is greater than 50% of the dominant species in the area of study being obligate wetland plants (OBL), facultative wetland plants (FACW), or facultative plants (FAC);
- Hydric soil possessing the characteristics typical of wetland soils; and
- Wetland hydrology, either inundated permanently or periodically saturated to the surface.

According to USACE definition of a wetland, all three characteristics must be present before an area is classified as a wetland.

1.1 Site Visits

Information for the North End Gravel Extraction Area at Elmendorf Air Force Base (EAFB) was collected during four site visits by Clarus Technologies, LLC personnel between September 5 and 24, 2005. The investigators used National Wetlands Inventory (NWI) aerial photographs and soil maps, in addition to on-site assessments. Wetland boundaries were delineated in the field using a Garmin GPS 12XL Global Positioning System units. All boundaries were consistent with NWI maps. Scientists also collected soil samples, used vegetation keys, and used hydrology indicators to make the wetland determinations. The determination methodology is consistent with that described in the Manual.

Within the approximate 300-acre limits of exploration for the gravel acquisition project, approximately 26.57 acres were identified as potential wetlands. Boundaries are based on NWI maps. The potential wetlands are identified as Areas 1, 2, and 3 located south of 37th Street, and Areas A through I located north of 37th Street as shown in Attachment 1.

All vegetation studies were conducted using the transect estimate method, as described in Part IV Section E of the 1987 Army Corps of Engineers Wetland Delineation Manual. Photographs of each wetland area are shown in Attachment 3, Photographic Log.

1.1.1 Area 1 Observations

Area 1 is bounded by 37th Street to the north and moraines of higher elevation to the south, west, and east. The area appears to have had limited recent human impacts. A metallic object was found south of the bog, presumably left from previous human activities, and litter was seen along the road by the bog. No extreme geological or hydrological changes caused by humans appear at this site. Area 1 also has standing water approximately four feet in depth in the southeast corner of the plot. Standing water appears in small depressions around the vegetated area as well.

Vegetation: Table 1, below, shows dominant plant species found at the site. All species appeared healthy upon observation, and no outside sources seem to be affecting vegetation health. Stem counts were used to find the percentage population within the wetland. More than 50% of dominant plant species were classified as OBL, FACW, or FAC. All of these plant species are indicative of wetlands.

Table 1: Area 1 Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage*
Birch, <i>Beta papyrifera</i>	Tree	FACU	10%
Black Spruce, <i>Picea mariana</i>	Tree	FACW	10%
Alder Sitka, <i>Alnus sinuata</i>	Tree	FAC	5%
Sweet Gale, <i>Myrica gale</i>	Shrub	OBL	30%
Dwarf Birch, <i>Betula glandulosa</i>	Shrub	FAC	10%
Sphagnum Moss, <i>Sphagnum angustifolium</i>	Herb	OBL	50%
Marsh Five Finger, <i>Potentilla palustris</i>	Herb	OBL	45%
Buck Bean, <i>Menyanthes trifolita</i>	Herb	OBL	36%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

** FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the northern section of Area 1 revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be a reddish black color, 2.5 YR 2.5/1 on the Munsell chart and had a peat (PT) grain size (organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: The area is inundated, and depth to saturated soil ranged from surface to six inches below grade. Drainage patterns are typical of those that would be found in wetlands. Water stained leaves as well as positive FAC-Neutral tests indicate the hydrology of a wetland area. There appears to be no surface water inlet or outlet running into or out of this wetland.

All three characteristics tested positive for a wetland in Area 1. This is an area which has wetland hydrology, wetland soils, and wetland vegetation. Since all three characteristics are present, the area is designated as a wetland.

1.1.2 Area 2 Observations

Area 2 is located directly east of Area 1, and is substantially smaller than Area 1. Area 2 has many of the same characteristics as Area 1 and is only separated by a moraine running north-south between the two plots.

Vegetation: Table 2, below, shows the dominant species found in Area 2. Vegetation in this area appears healthy and no site conditions seem to be altering species health. 37th Street lines the north end of the bog, separating Area 2 and Area F. Stem counts were used to find the percentage population within the area. The dominant plant is sedge (*Carex aquatilis*). More than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area 2 is indicative of a wetland.

Table 2: Area 2 Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Birch, <i>Betula papyrifera</i>	Tree	FACU	10%
Black Spruce, <i>Picea mariana</i>	Tree	FACW	10%
Alder Sitka, <i>Alnus sinuata</i>	Tree	FAC	5%
Mare's Tail, <i>Hippuris montana</i>	Herb	OBL	50%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	50%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

**FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the northern section of Area 2 revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be 2.5 YR 2.5/1 on the Munsell chart and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet revealed water at the surface. There was saturated soil within the area and standing water was encountered. No stream or running water appears in this wetland. Indicators of wetland hydrology included inundated soil, saturation in the upper 12 inches, drainage patterns, water-stained leaves, and local survey data from the NWI. The hydrology in the Area 2 is indicative of a wetland.

All three indicators tested positive in Area 2. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three indicators are present, the area is designated as a wetland.

1.1.3 Area 3 Observations

Area 3 is located south of 37th Street in the western section of the North End Gravel Extraction site. This area is also smaller than Area 1.

Vegetation: Table 3, below, shows the dominant species found in Area 3. This clearing is surrounded by birch and alder. Standing dead birch exists within the area. The dominant herb is sedge, and vegetation appears healthy and thriving. The road to the north does not appear to affect the species type or health. Stem counts were used to find the percentage population within the wetland. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area 3 is indicative of a wetland.

Table 3: Area 3 Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Black Spruce, <i>Picea mariana</i>	Tree	FACW	5%
Birch, <i>Betula papyrifera</i>	Tree	FACU	10%
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	20%
Red Elder, <i>Sambucus racemosa</i>	Shrub	FACU	40%
Sedge, <i>Carex garberi</i>	Herb	FACW	60%
Sphagnum Moss, <i>Sphagnum angustifolium</i>	Herb	OBL	55%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

** FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of one foot in the center of Area 3 revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be dark reddish gray in color and 2.5 YR 3/1 on the Munsell chart with a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of one foot in the area found water at the surface. There was saturated soil within the area with standing water. Lower elevation areas within the grassy area revealed ponded water, on average 1-2 feet in diameter. No stream or running water appears in the area. Indicators of wetland hydrology included inundated soil, saturation in the upper 12 inches, drainage patterns, water-stained leaves, and local survey data from the NWI. The hydrology in Area 3 is indicative of a wetland.

Area 3 appears to be a catchment of ground and surface water for the surrounding hills, to the north, south, and east. 37th Street, located to the west, is also higher in elevation. All three characteristics tested positive in Area 3. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present, the area is designated as a wetland.

1.1.4 Area A Observations

Area A is located north of 37th Street on the eastern side of the North End Gravel Extraction Area. This location is a freshwater emergent wetland. There appears to be no inlet or outlet or water movement within the site. This is a low-lying area surrounded by moraines covered by birch and spruce.

Vegetation: Table 4, below, shows the dominant species found in Area A. All plants appeared healthy, and no site conditions that may alter the species were found upon the site visit. Stem counts were used to find the dominant species, which is sedge. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area A is indicative of a wetland.

Table 4: Area A Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Black Spruce, <i>Picea mariana</i>	Tree	FACW	10%
Birch, <i>Betula papyrifera</i>	Tree	FACU	15%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	60%
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	40%
Sphagnum Moss, <i>Sphagnum angustifolium</i>	Herb	OBL	60%
Labrador Tea, <i>Ledum palustris</i>	Herb	FACW	50%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

** FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the northern section of Area A revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be black, 5 YR 2.5/1 on the Munsell chart, and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within 1 foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet revealed water at the surface. There was saturated soil within the area and standing water. No stream or running water appears in this wetland. Indicators of wetland hydrology included inundated soil, saturation in the upper 12 inches, drainage patterns, water-stained leaves, and local survey data from the NWI. The hydrology in Area A is indicative of a wetland.

All three characteristics tested positive in Area A. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present in this area, the area is designated as a wetland.

1.1.5 Area B Observations

Area B is located just north of 37th Street and west of an unnamed road in the North End Gravel Extraction Area. This location is characterized by high grasses and contains a ditch along 37th Street. Area B appears to be a receiving point for drainage from the high elevations of moraines which surround it. This small 1.0-1.5 acre area does not seem to have any inlet or outlet.

Vegetation: Table 5, below, shows the dominant species found in Area B. Stem counts were used to find the percentage population within the wetland. All plants appeared healthy, and no site conditions that may alter the species were found at the site. This small area is occupied mostly by sedge. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area 5 is indicative of a wetland.

Table 5: Area B Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	10%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	80%
Marsh Five Finger, <i>Potentilla palustris</i>	Herb	OBL	30%
Sphagnum Moss, <i>Sphagnum angustifolium</i>	Herb	OBL	40%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

Soil: A boring advanced to a depth of two feet in the center of Area B revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The soil was very dark with grassy roots predominating in the top foot. The soil was organic with a lot of decaying material throughout. The matrix color was determined to be a reddish black, 2.5 YR 2.5/1 on the Munsell chart, and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet in the area revealed water at the surface. There was saturated soil within the area and standing water found. Wetland indicators included water marks, inundated soils, saturation in the upper 12 inches, drainage patterns, water stained leaves, and local survey data from the NWI. No stream or running water appears in this area. A ditch filled with water lined the south end of the wetland along 37th Street. The hydrology in Area B is indicative of a wetland.

All three characteristics tested positive in Area B. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present in this area, the area is designated as a wetland.

1.1.6 Area C Observations

Area C is located west of an unnamed dirt road north of 37th Street. This location has a road bank to the east, and higher elevated material to the north, south, and west. This area has no outlet or inlet of running water and appears to receive drainage from the surrounding hills. Sedges dominate the center of the area with birch and spruce dominating in the perimeter.

Vegetation: Table 6, below, shows the dominant species found in Area C. Stem counts were used to find the percentage population within the wetland. Spruce and birch are by far the most dominant species of trees. Vegetation appears healthy in this small area, and the road to the east seems to cut off any water movement from Area D. No site conditions appear to affect the health of the vegetation. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area C is indicative of a wetland.

Table 6: Area C Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Willow, <i>Salix glauca</i>	Shrub	FAC	10%
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	5%
Birch, <i>Betula papyrifera</i>	Tree	FACU	10%
Black Spruce, <i>Picea mariana</i>	Tree	FACW	8%
Sedge, <i>Carex garberi</i>	Herb	FACW	75%
Sphagnum Moss, <i>Sphagnum angustifolium</i>	Herb	OBL	60%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

**FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the center of Area C revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be reddish black, 2.5 YR 2.5/1 on the Munsell chart, and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet in the area revealed water at the surface. There was saturated soil within the area and standing water found. Wetland indicators included water marks, inundated soils, saturation in the upper 12 inches, drainage patterns, water stained leaves, and local survey data from the NWI. No stream or running water appears in this area. The hydrology in Area C is indicative of a wetland.

All three characteristics tested positive in Area C. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present, the area is designated as a wetland.

1.1.7 Area D Observations

Area D is located east of Area C, across an unnamed street. This area seems to be slightly higher in elevation than Area C and vegetation seems to be a bit different in that spruce population dominates. This area has no inlet or outlet.

Vegetation: Table 7, below, shows the dominant species found in Area D. Stem counts were used to find the percentage population within the wetland. All plants appeared healthy, and no site conditions that may alter the species were found at the site. Spruce is the dominant tree species. Only one species of shrub appears within the wetland, which is alder. Other shrubs appear just outside the wetland. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area D is indicative of a wetland.

Table 7: Area D Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Black Spruce, <i>Picea mariana</i>	Tree	FACW	30%
Birch, <i>Betula papyrifera</i>	Tree	FACU	10%
Sedge, <i>Carex garberi</i>	Herb	OBL	45%
Labrador Tea, <i>Ledum palustris</i>	Herb	FACW	30%
Sphagnum Moss, <i>Sphagnum angustifolium</i>	Herb	OBL	40%
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	10%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

**FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the northern section of Area D revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The soil itself was more dense, and more rocks were intermittent throughout this area. The matrix color was determined to be black, 5 YR 2.5/1 on the Munsell chart, and had a PT grain size (highly organic soil) throughout. Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet in the area revealed water at the surface. There was saturated soil within the area and standing water found. Drainage systems differed in this wetland in that there were many elevated spots that could sustain trees. Lower elevated areas around the trees were inundated with water and definite channels of water appeared in this wetland. Wetland indicators included inundated soils, water marks, saturation in the upper 12

inches, typical wetland drainage pattern, water stained leaves, and local soil survey data. No running water appears in this wetland. The hydrology in Area D is indicative of a wetland.

All three characteristics tested positive in Area D. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present, the area is designated as a wetland.

1.1.8 Area E Observations

Area E is located in the northern section of the North End Gravel Extraction Area, just north of Area C. Higher elevation surrounds this site with moraines and hills to the north, south, and west. A dirt road borders the eastern side of this bog. No inlet or outlet was found in this area and the area appears to be a catchment of ground water and surface water for surrounding hills.

Vegetation: Table 8, below, shows the dominant species found in Area E. Stem counts were used for a population count, and predominantly labrador tea was found on the plot. All plants appeared healthy, and no site conditions that may alter the species were found at the site. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area E is indicative of a wetland.

Table 8: Area E Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Cottonwood, <i>Populus fremonti</i>	Tree	FACU	2%
Poplar Balsam, <i>Populus balsamifera</i>	Tree	FACU	5%
Birch, <i>Betula papyrifera</i>	Tree	FACU	8%
Black Spruce, <i>Picea mariana</i>	Shrub	FACW	10%
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	12%
Labrador Tea, <i>Ledum palustris</i>	Herb	FACW	70%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	50%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

**FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the northern section of Area E revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be black, 7.5 YR 2.5/1 on the Munsell chart, and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet in the area and revealed water at the surface. There was saturated soil within the area and standing water found. Wetland indicators present at this site were inundated soils, saturation of soils above 12 inches, wetland drainage

patterns, water stained leaves, and local soil survey data. No stream or running water appears in this wetland. The hydrology in Area E is indicative of a wetland.

All three characteristics tested positive in Area E. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present, the area is designated as a wetland.

1.1.9 Area F Observations

Area F is located in the center of the North End Gravel Extraction Area, north of 37th Street, and across the unnamed street from Area B. Elevation is higher all around the site and appears to be a low lying drainage site for surrounding hills.

Vegetation: Table 9, below, shows the dominant species found in Area F. Stem counts were used to find the percentage population within the wetland. There are no site conditions that seem to be affecting population or health of any existing species on site, and health of the vegetation looks good. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area F is indicative of a wetland.

Table 9: Area F Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Birch, <i>Betula papyrifera</i>	Tree	FACU	10%
Alder, <i>Alnus glutinosa</i>	Tree	FAC	18%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	75%
Marsh Five Finger, <i>Potentilla palustris</i>	Herb	OBL	30%
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	12%
Fireweed, <i>Epilobium angustifolium</i>	Shrub	FACU	10%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

** FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the northern section of Area F revealed water saturation at the surface. Soil is mucky. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be black, 7.5 YR 2.5/1 on the Munsell charts and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet in the area revealed water at the surface. There was saturated soil within the area and standing water found. Wetland indicators found at this site are inundated soils, saturation of soils within the upper 12 inches, water marks, water stained leaves, and local soil survey data from NWI. Standing water approximately one foot

deep runs east-west through the center of the bog. No stream or running water appears in this wetland. The hydrology in Area F is indicative of a wetland.

All three characteristics tested positive in Area F. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present, the area is designated as a wetland.

1.1.10 Area G Observations

Area G is located northwest of Area F, separated only by higher ground between them. The area is surrounded by hills and there is no inlet or outlet of running water on this site. This location appears to be another low-lying drainage site for moraines that surround it.

Vegetation: Table 10, below, shows the dominant species found in Area G. Stem counts were used to find the percentage population within the wetland. The species at this location are identical to area F, only split by a small hill to the east. No site conditions exist around the wetland that would affect plants or their health. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area G is indicative of a wetland.

Table 10: Area G Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Birch, <i>Betula papyrifera</i>	Tree	FACU	8%
Alder, <i>Alnus glutinosa</i>	Tree	FAC	12%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	75%
Marsh Five Finger, <i>Potentilla palustris</i>	Herb	OBL	30%
Alder, <i>Alnus glutinosa</i>	Shrub	FAC	18%
Fireweed, <i>Epilobium angustifolium</i>	Shrub	FACU	6%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

** FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of two feet in the northern section of Area G revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be black, 2.5 YR 2.5/1 on the Munsell charts, and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of two feet in the area revealed water at the surface. There was saturated soil within the area and standing water found. A pond was found in the east corner of this wetland. Again, no stream or running water appears in this wetland. Indicators of wetland hydrology included inundated soil, saturation in the upper 12 inches, drainage patterns,

water-stained leaves, and local survey data from the NWI. The hydrology in Area G is indicative of a wetland.

All three characteristics tested positive in Area G. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present, the area is designated as a wetland.

1.1.11 Area H Observations

Area H is located in the western section north of 37th Street of the North End Gravel Extraction Area. This small area (approximately one acre) is surrounded by moraines. There was no inlet or outlet of running water found in the site. This area appears to be a catchment of ground water and surface water for surrounding hillsides.

Vegetation: Table 11, below, shows the dominant species found in Area H. Stem counts were used to find the percentage population within the wetland. The center of the clearing is dominated by sedge (*Carex aquatilis*) and labrador tea (*Ledum palustris*). There do not appear to be any interferences with plant health or population at this location. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area H is indicative of a wetland.

Table 11: Area H Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Birch, <i>Betula papyrifera</i>	Tree	FACU	2%
Alder, <i>Alnus glutinosa</i>	Tree	FAC	8%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	70%
Willow, <i>Salix glauca</i>	Shrub	FAC	15%
Black Spruce, <i>Picea mariana</i>	Tree	FACW	10%
Labrador Tea, <i>Ledum palustris</i>	Herb	FACW	20%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

Soil: A boring advanced to a depth of one foot in the center of Area H revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be very dark gray, 2.5 YR 2.5/1 on the Munsell chart, and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this characteristic can be classified as wetland soil.

Hydrology: A boring advanced to a depth of one foot in the area revealed water at the surface. There was saturated soil within the area and standing water found. No stream or running water appears in this wetland. Wetland hydrology indicators include inundated soils, water marks, saturation within the upper 12 inches, drainage patterns of wetlands, water stained leaves, and local soil survey data by NWI. The hydrology in Area H is indicative of a wetland.

All three characteristics tested positive in Area H. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present, the area is designated as a wetland.

1.1.12 Area I Observations

Area I is located in the northwest section of the North End Gravel Extraction Area. Only a portion of this wetland is located within the boundaries of the North End Gravel Extraction Area. This area is surrounded by moraines and an unnamed road runs north of the area. This location appears to be a catchment of ground water and surface water for surrounding hillsides.

Vegetation: Table 12, below, shows the dominant species found in Area I. Stem counts were used to find the percentage population within the wetland. The center of the clearing is dominated by moss (*Sphagnum angustifolium*) and labrador tea (*Ledum palustris*). There are no interferences with plant health or population at this location. Greater than 50% of dominant plant species were classified as OBL, FACW, or FAC. Vegetation in Area I is indicative of a wetland.

Table 12: Area I Plant Species Identified

Dominant Plant Species	Stratum	Indicator	Approximate % Coverage *
Birch, <i>Betula papyrifera</i>	Tree	FACU	2%
Alder, <i>Alnus glutinosa</i>	Tree	FAC	8%
Sedge, <i>Carex aquatilis</i>	Herb	OBL	70%
Sphagnum Moss, <i>Sphagnum angustifolium</i>	Herb	OBL	15%
Black Spruce, <i>Picea mariana</i>	Tree	FACW	10%
Black Spruce, <i>Picea mariana</i>	Shrub	FACW	5%
Labrador Tea, <i>Ledum palustris</i>	Herb	FACW	20%

* Indicates the % coverage for all plant species. For this reason, the total of the % coverages will often exceed 100% due to species overlap; e.g., grass growing through moss.

** FACU = Facultative Uplands Species.

Soil: A boring advanced to a depth of one foot in the center of Area I revealed water saturation at the surface. Roots and organic material prevailed throughout the core sample. The matrix color was determined to be black, 5 YR 2.5/1 on the Munsell charts, and had a PT grain size (highly organic soil). Four histic soil indicators were present; histosol, sulfidic odor, aquic moisture regime, and low-chroma colors. Since this material was saturated within one foot of the surface and four histic soil indicators were present, this material can be classified as wetland soil.

Hydrology: A boring advanced to a depth of one foot in the area revealed water at the surface. There was saturated soil within the area and standing water found. Although no inlet or outlet was found in the area upon site investigation, ponds on the west side of the wetland show very high probability of running water, such as a creek or stream, through this area. Wetland hydrology indicators include inundated soils, water marks, saturation within the upper 12 inches,

drainage patterns of wetlands, water stained leaves, and local soil survey data by NWI. The hydrology in the Area I is characteristic of a wetland.

All three characteristics tested positive in Area I. Hydrophytic vegetation and hydric soils are present, as well as wetland hydrology. Since all three characteristics are present in this area, the area is designated as a wetland within the boundaries of the North End Gravel Extraction Area. Area I can also be considered a freshwater pond in the western section, and an emergent wetland in the northern section of its boundaries.

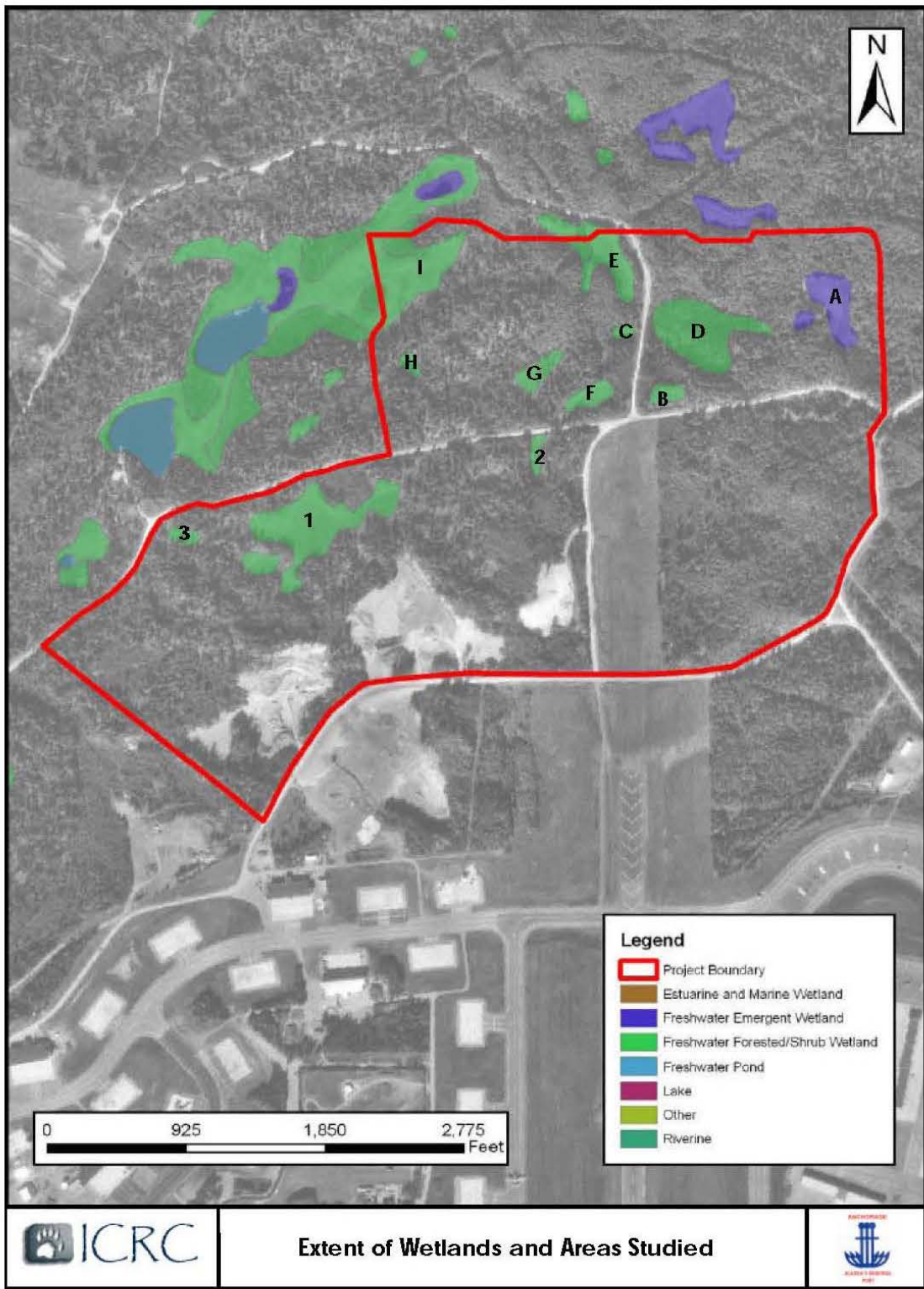
SECTION 2 Summary

Within the approximate 300-acre limits of exploration for the North End Gravel Extraction project, approximately 26.57 acres are identified as potential wetlands. Boundaries are based on NWI maps. Areas 1, 2, and 3 located south of 37th Street, and Areas A through I located north of 37th Street as shown in Attachment 1 have been determined as wetlands. Additionally, Area I can also be considered a freshwater pond in the western section, and an emergent wetland in the northern section of its boundaries.

All areas investigated are identified as wetlands. No surface water runs into or out of any of these areas. Attachment 1 demonstrates that the findings of the site visits match the US Fish and Wildlife National Wetland Inventory maps.

Attachment 1

Extent of Wetlands and Areas Studied



Attachment 2

Data Forms

DATA FORM
ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Large Plot -
Area 1

Project/Site: <u>EAFB N of Runway #1 (LARGE Plot)</u> Applicant/Owner: <u>UNITED STATES AIR FORCE</u> Investigator: <u>MIKE ANDERSON AND LEIGH HIGH</u>	Date: <u>9/6/05</u> County: _____ State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
✓ 1. BIRCH "BETULA Papyrifera"	TREE	FACW	9. SPHAGNUM MOSS	Herb	OBL ✓
✓ 2. SPRUCE "PICEA MARIANA"	TREE	FACW	10. _____	_____	_____
✓ 3. _____	_____	_____	11. MARSH FIVE FINGER	Herb	OBL ✓
✓ 4. ALDER "ALNUS"	SHrub	FACW	12. "POTENTILLA ANSERINA"	_____	_____
✓ 5. _____	_____	_____	13. _____	_____	_____
✓ 6. SWEET GALE	SHrub	OBL	14. BUCK BEAN	Herb	OBL
✓ 7. "MYRICA GALE"	_____	_____	15. "MENYANTHES TRIFOLITA"	_____	_____
✓ 8. DWARF BIRCH	SHrub	FAC	16. _____	_____	_____
"Betula glandulosa"	_____	_____			

Percent of Dominant Species that are OBL, FACW or FAC 7/8 = 88% 4 of 8 are OBL
 (excluding FAC-).

Remarks: 50% OBLIGATE WETLAND SPECIES

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p>Stream, Lake, or Tide Gauge _____</p> <p><input checked="" type="checkbox"/> Aerial Photographs</p> <p>Other _____</p> <p>No Recorded Data Available _____</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 inches</p> <p>Water Marks _____</p> <p>Drift Lines _____</p> <p>Sediment Deposits _____</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>_____ Oxidized Root Channels in Upper 12 inches</p> <p>_____ Water-Stained Leaves</p> <p>_____ Local Soil Survey Data</p> <p><input checked="" type="checkbox"/> FAC-Neutral Test</p> <p>Other (Explain in Remarks) _____</p>
<p>Remarks: <u>SATURATED to WETLAND BORDERS</u> <u>WETLAND ENDS AT DEFINED VEGETATION CHANGE</u></p>	

SOILS

Large PLOT - Area 1

Map Unit Name (Series and Phase): _____		Drainage Class: _____			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			

Profile Description: Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
6		2.5 YR 2.5/1	—	none	PT
12		2.5 YR 2.5/1	—	none	PT
18		2.5 YR 2.5/1	—	none	PT
24		2.5 YR 2.5/1	—	none	PT

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input checked="" type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: ORGANIC LAYER GREATER THAN 2 1/2 FEET.
PEAT BOG.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
---	--

Remarks: OBVIOUS PEAT BOG. SITE HAS SEVERAL CONNECTED BRANCHES OF WETLAND SITES. THERE IS ALSO A PONDED AREA AS WELL AS A BOG.

Approved by HQUSAGE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Small PLOT - Area
2

Project/Site: <u>EAFB N. of RUNWAY #2 (Small Plot)</u>	Date: <u>8/6/05</u>
Applicant/Owner:	County: _____
Investigator: <u>MIKE ANDERSON + LEIGH NICH</u>	State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: _____
Is the site significantly disturbed (Atypical Situation)? <input checked="" type="radio"/> Yes <input type="radio"/> No	Transect ID: _____
Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No	Plot ID: _____
(If needed, explain on reverse.)	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Birch "Betula papyrifera"	TREE	FACU	9. MALE'S TAIL	HERB	OBL
2. SPRUCE "Picea mariana"	TREE	FACW	10. Hippuris montana		
3. _____			11. _____		
4. Alder "Alnus"	Shrub	FAC-M	12. Sedges		
5. Black Spruce	Shrub	FACW	13. Carex aquatilis	HERB	OBL
6. "Picea mariana"			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC): 5/6 = 85%

Remarks: 2 are OBLIGATE
2 ARE FAC. WET
1 IS FAC

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input checked="" type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 inches</p> <p><input type="checkbox"/> Water-Stained Leaves</p> <p><input type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Remarks: <u>SATURATED throughout AND SOME AREAS ARE COMPLETELY INUNDATED</u></p>

Small PLOT - Area
2

SOILS

Map Unit Name
(Series and Phase): _____

Taxonomy (Subgroup): _____

Drainage Class: _____

Field Observations
Confirm Mapped Type? Yes No

Profile Description:

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
6		2.5 YR 2.5/1	—	none	PT
12		2.5 YR 2.5/1	—	none	PT
18		2.5 YR 2.5/1	—	none	PT
24		2.5 YR 2.5/1	—	none	PT

Hydric Soil Indicators:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Histosol | <input type="checkbox"/> Concretions |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils |
| <input checked="" type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input checked="" type="checkbox"/> Aquic Moisture Regime | <input type="checkbox"/> Listed on Local Hydric Soils List |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Listed on National Hydric Soils List |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | <input type="checkbox"/> Other (Explain in Remarks) |

Remarks:

ORGANIC LAYER BELOW 2 FEET

WETLAND DETERMINATION

Hydrophytic Vegetation Present?

Yes No (Circle)

Yes No

Yes No

Wetland Hydrology Present?

Hydric Soils Present?

(Circle)

Is this Sampling Point Within a Wetland? Yes No

Remarks:

NOT Hydrologically Connected to
PLOT ONE, but directly ADJACENT to
PLOT ONE. SEPERATED by NARROW SECTION
of DRY HABITAT.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area 3</u> Applicant/Owner: <u>EAFB</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/17/05</u> County: <u>EAFB</u> State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>basal</u> Spruce "Betula papyrifera" Tree		FACU < 10	9. <u>Sedge</u>	herb	FACW
2. Spruce "Picea mariana" Tree		FACU < 10	10. "Carex garberi"		
3. Birch "Betula papyrifera" Tree		FACW	11. _____		
4. alder "Alnus glutinosa" Shrub		FAC	12. <u>Sphagnum moss</u>	herb	OBL
5. _____			13. _____		
6. <u>red alder</u>	Shrub	FACU	14. _____		
7. "Sambucus racemosa"			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 4/6 = 66.7%

Remarks: Firm, grass, fireweed, ... clearing (circular) surrounded by birch + alder.
the Birch toward center is dead. Dominant herb is sedge. 4/6 = 66.7%.
Took samples from center of wetland. Small area. wetland species

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p>___ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p>___ Water-Stained Leaves</p> <p>___ Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
Remarks: <u>standing water to top.</u>	

SOILS Area 3

Map Unit Name (Series and Phase): <u>NW1 map</u>		Drainage Class: _____	
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No	

Profile Description: Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0	0	2.5Y 3/1	none	—	} PT grain size. reddish black color.
3				—	
6		2.5Y 3/1		—	
12		2.5Y 3/1		—	

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input checked="" type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input checked="" type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	---

Remarks: Hills to S, N + E. Road to west. This area is surrounded by moraines, and 37th to the north-west. It is a circular low lying area that takes ground + surface water from higher areas around it.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Remarks:	

* NOTE - man-made eagle nest North of this site.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
 (1987 COE Wetlands Delineation Manual)

Area A

Project/Site: <u>North of 37th - Area A</u> Applicant/Owner: <u>OSAF</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/17/05</u> County: <u>EAFB</u> State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.) 	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Spruce "Picea mariana"	Tree	FACU <10	9. _____	_____	_____
2. Birch "Betula papyrifera"	Tree	FACW	10. _____	_____	_____
3. Sedge "Carex agutifilis"	herb	OBL	11. _____	_____	_____
4. Alder "Alnus glutinosa"	Shrub	FAC	12. _____	_____	_____
5. Sphagnum moss "Sphagnum"	herb	OBL	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. Labrador tea "Ledum palustre"	herb	FACW	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 4/5 = 66%

Remarks: Stem counts used for population count. Samples taken from eastern side of wetland. Exposed water in center of wetland. Species all seem healthy. No surrounding developments etc. Mostly sedge here.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Remarks: <u>No inlet or outlet for water movement. Strictly ground saturation - water channels through grasses. Small drainage streams seen within grasses from hills from recent rains.</u></p>	

SOILS - Area A

Map Unit Name (Series and Phase): <u>NWI</u>		Drainage Class: _____	
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Profile Description:		Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon				
0	0				
6		5YR 2.5/1	—	—	} moss + all organic top foot. Black color with roots which extend down all through 2nd foot. PT. Black color.
12		5YR 2.5/1		—	
18		5YR 2.5/1		—	
24		5YR 2.5/1		—	

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: Surrounding geology - low lying area surrounded by hills - presumably moraines, covered with birch + spruce. Circular. Saturated throughout. Dark color soil, lots of decayed material, with roots throughout. Mostly sedge here.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
---	--

Remarks: moss covered soil - completely saturated to top. No running water - no inlet or outlet. Assumed this low-lying area is a drainage area for surrounding moraines.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>North of 37th, Area B</u> Applicant/Owner: <u>EAFB</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/17/05</u> County: _____ State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. <u>Alder "Alnus glutinosa"</u>	<u>Shrub</u>	<u>FAC-ALL</u>
2. <u>Sedge "Carex aquatilis"</u>	<u>herb</u>	<u>OBL</u>
3. <u>Muscle Fivefinger "Potentilla palustris"</u>	<u>herb</u>	<u>OBL</u>
4. <u>Sphagnum moss "Sphagnum sp."</u>	<u>herb</u>	<u>OBL</u>
5. _____	_____	_____
6. _____	_____	_____
7. _____	_____	_____
8. _____	_____	_____

Dominant Plant Species	Stratum	Indicator
9. _____	_____	_____
10. _____	_____	_____
11. _____	_____	_____
12. _____	_____	_____
13. _____	_____	_____
14. _____	_____	_____
15. _____	_____	_____
16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/4 = 75 %

Remarks: Small area - maybe 1 acre. mostly sedge here. Road to south which is built up causes existence of ditch on south end. Sedge + veg. appears healthy. Used stem count for % coverage

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks):</p> <p>___ Stream, Lake, or Tide Gauge</p> <p><input checked="" type="checkbox"/> Aerial Photographs</p> <p>___ Other</p> <p>___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p>___ Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Remarks: <u>High grasses in over-saturated soil. Lined to 37th on north side. Ditch along road where ponding occurs.</u></p> <p style="text-align: center;"><u>24 ft</u> <u>East of bog</u> <u>South</u></p>	

SOILS Area B

Map Unit Name (Series and Phase): <u>NW1</u>		Drainage Class: _____	
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0	O	2.5 YR 2.5/1	—		} very dark organic soil with grassy roots throughout. Organic + consistent all the way down to 2 feet. PT. Reddish black color.
6		2.5 YR 2.5/1	—		
12		↓	—		
18			—		
24			—		

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: Area B found mostly grasses with high elevations around / No running water. Standing water + saturated soil. Drainage streams seen within grasses from recent rains.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
---	--

Remarks: This small - 1 to 1/2 acre area does not seem to have any in let or outlet, but it does appear to be a bog. Obligate grasses dominate the area, soils are oversaturated, and the soil type is consistent with wetland determination. The area is surrounded by birch + spruce as well as higher elevated fauna.

Approved by HQUSACE 3/92

1 - 1/2 Acre

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area C</u> Applicant/Owner: <u>USAF</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/17/05</u> County: <u>EAFB</u> State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Willow "Salix glauca"</u>	<u>Shrub</u>	<u>FAC</u>	9. _____	_____	_____
2. <u>alder "Alnus glutinosa"</u>	<u>shrub</u>	<u>FAC</u>	10. _____	_____	_____
3. <u>birch "Betula papyrifera"</u>	<u>Tree</u>	<u>FACU</u>	11. _____	_____	_____
4. <u>Spruce "Picea Mariana"</u>	<u>tree</u>	<u>FACW</u>	12. _____	_____	_____
5. <u>Sphagnum moss</u>	<u>herb</u>	<u>OBL</u>	13. _____	_____	_____
6. <u>Sedge "Carex garberi"</u>	<u>herb</u>	<u>FACW</u>	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 5/6 = 83%.

Remarks: Used stem counts for herbs and shrubs. 5/6 = 83% wetland species. Birch + Spruce are by far dominant species of trees. - they align the outside of the wetland. Small area. Samples taken from center of wetland. Vegetation appears healthy. Small area. No site conditions appear to affect the vegetation.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><input type="checkbox"/> Stream, Lake, or Tide Gauge</p> <p><input checked="" type="checkbox"/> Aerial Photographs</p> <p><input type="checkbox"/> Other</p> <p><input type="checkbox"/> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input type="checkbox"/> Water Marks</p> <p><input type="checkbox"/> Drift Lines</p> <p><input type="checkbox"/> Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p><input type="checkbox"/> FAC-Neutral Test</p> <p><input type="checkbox"/> Other (Explain in Remarks)</p>
<p>Remarks: <u>Upon digging, soil is over saturated. No inlet or outlet of water in this area. Drainage streams within grasses found - assumed formed when last rained drained water from surrounding hills.</u></p>	

SOILS

Area C

Map Unit Name

(Series and Phase): ~~XXX~~ NW1

Drainage Class: _____

Field Observations

Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup): _____

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0	O	2.5 YR 2.5/1	—	none	} highly organic/ lots of roots. PT. reddish black color
6		↓	—	↓	
12			—		
18			—		} still organic, less roots. PT. reddish black color
24		↓	—		

Hydric Soil Indicators:

- ☒ Histosol
☒ Histic Epipedon
☒ Sulfidic Odor
☒ Aquic Moisture Regime
☒ Reducing Conditions
☒ Gleyed or Low-Chroma Colors

- ☐ Concretions
☐ High Organic Content in Surface Layer in Sandy Soils
☐ Organic Streaking in Sandy Soils
☐ Listed on Local Hydric Soils List
☐ Listed on National Hydric Soils List
☐ Other (Explain in Remarks)

Remarks: Soil is dark in color and very organic with a lot of roots in the top foot. Area is surrounded by moraines, and a dirt road to the east. This is a low lying area, where water from other areas drain into.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?

(Yes) No (Circle)

Wetland Hydrology Present?

(Yes) No

Hydric Soils Present?

(Yes) No

(Circle)

Is this Sampling Point Within a Wetland? (Yes) No

Remarks: Surrounding geology - road bank to east, higher ground to N, W, S. No inlet or outlet - water appears to be draining from surrounding hills. Grasses dominate with birch + spruce outlying.

Approved by HQUSACE 3/92

pic 43-45.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area D</u> Applicant/Owner: <u>EAFB</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/17/05</u> County: <u>EAFB</u> State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Spruce "Picea mariana"	Tree	FACW	9. _____	_____	_____
2. birch "Betula papyrifera"	tree	FACU	10. _____	_____	_____
3. Alder "Alnus glutinosa"	Shrub	FAC	11. _____	_____	_____
4. Sphagnum moss	herb	OBL	12. _____	_____	_____
5. Sedge "Carex garberi"	herb	FACW	13. _____	_____	_____
6. Labrador tea "Ledum palustre"	herb	FACW	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 5/6 = 83%

Remarks: more spruce + alder surrounding bog. Brush is more dense here. Only one shrub in the wetland - alder. The other shrubs are outside the wetland. 5/6 wetland species = 83%. Samples taken from western side of wetland.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks ___ Drift Lines ___ Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands <p>Secondary Indicators (2 or more required):</p> ___ Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input checked="" type="checkbox"/> Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
<p>Remarks: <u>Slightly higher elevation + soils look a little more rocky (less organics) - the drainage patterns are more easier to find in this area because grasses are not growing through entire field as Area A, B + C.</u></p>	

* barrels found along road.

SOILS Area D.

Map Unit Name (Series and Phase): <u>NWI</u>			Drainage Class: _____	
Taxonomy (Subgroup): _____			Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Profile Description:		Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon				
0		5YR 3/1	—	none	Dark color with
6		5YR 3/1	—		dominating roots extending to
12		5YR 3/1	—		about 1 ft. more
18		5YR 3/1	—		pebbles + sand
24		5YR 3/1	—		mixed w/ organics from 1-2 ft. PT.

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input checked="" type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: Soil more dense, more rocks intermittent w/ soil. Spruce found more throughout this area. Area D is surrounded by moraines just west (and across the dirt road) of Area C. Again, it looks like a burying area which absorbs surrounding runoff + groundwater. This is a slightly higher elevation than Area A or B or C.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
---	--

Remarks: no inlet or outlet here. Soil color + saturation, dominating obligate plant types, and hydrological evidence indicates this is a wetland.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area H</u> Applicant/Owner: <u>EAFB</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/1/05</u> County: _____ State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.) 	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Birch "Betula papyrifera" Tree		FACU	9. _____		
2. Alder "Alnus glutinosa" Tree		FAC	10. _____		
3. Willow "Salix glauca" Shrub		FAC	11. _____		
4. Sedge "Carex aquatilis" herb		OBL	12. _____		
5. Spruce "Picea mariana" Tree		FACW	13. _____		
6. Labrador tea "Ledum palustre" herb		FACW	14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC $5/6 = 83\%$
(excluding FAC-).

Remarks: No human or other alterations to vegetation; vegetation appears healthy, although this is a very small area. Sedges dominate the wetland, with birch + spruce surrounding it.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.) Depth to Free Water in Pit: <u>0</u> (in.) Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks ___ Drift Lines ___ Sediment Deposits <input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required): <input checked="" type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input checked="" type="checkbox"/> Water-Stained Leaves <input checked="" type="checkbox"/> Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)</p>
<p>Remarks: <u>Soil is inundated with water. No moving water or streams are apparent. Appears to be a catchment of ground surface water for hills surrounding it.</u></p>	

SOILS Area H

Map Unit Name (Series and Phase): <u>NW1</u>		Drainage Class: _____	
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No	

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0	O	7.5 YR 3/4	none	—	very dark gray color;
6		↓	1	—	PT grain size.
12		↓	1	—	Roots dominate
		↓			through sample.

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input checked="" type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: This bog is surrounded by hills + seems to be a catchment for ground + surface water. Very small area, > 1 acre. There is no evidence of streams or running water.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle) Wetland Hydrology Present? (Yes) No Hydric Soils Present? (Yes) No	Is this Sampling Point Within a Wetland? (Circle) Yes No
--	--

Remarks: No inlet or outlet here. Soil color + situation, dominating obligate plant types, + hydrological evidence indicates this is a wetland.

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area E</u> Applicant/Owner: <u>USAF</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/17/05</u> County: <u>EAAB</u> State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? Yes <input checked="" type="radio"/> No <input type="radio"/> Is the area a potential Problem Area? Yes <input checked="" type="radio"/> No <input type="radio"/> (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

strawberry
sagebrush moss

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cottonwood "Populus fremontii"	Tree	FACU	9. _____	_____	_____
2. Poplar balsam "Populus balsamifera"	Tree	FACU	10. _____	_____	_____
3. Birch "Betula papyrifera"	Tree	FACU	11. _____	_____	_____
4. Spruce "Picea mariana"	Shrub	FACW	12. _____	_____	_____
5. Alder "Alnus glutinosa"	Shrub	FAC	13. _____	_____	_____
6. Labrador tea "Ledum palustre"	herb	FACW	14. _____	_____	_____
7. Sedge "Carex aquatilis"	herb	OBL	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 4/6 = 66%.

Remarks: Stem counts used in population count. Predominantly Labrador tea in plot. 4/6 = 66% wetland species. Samples taken from southern part of wetland.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Remarks: <u>Oversaturated soil where obligates are present. Exposed lake in middle of area E. About 1/4 of vegetation around lake is a floating bog-grasses are not in soil.</u></p>	

SOILS Area E

Map Unit Name (Series and Phase): <u>NW1</u>		Drainage Class: _____ Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Taxonomy (Subgroup): _____			

Profile Description: Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
0	0	7.5YR 2.5/	—	none	PT. consistent
6		↓	—	↓	dark organic
12		↓	—	↓	material with
18		↓	—	↓	moss + root
24		↓	—	↓	systems throughout
					Black color.

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: Surrounding geology - higher level higher elevation surrounds this bog. No inlet or outlet. ~~Area~~ Low-lying area looks like a bog - water from groundwater + runoff from surrounding hills.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Remarks: <u>Standing water w/ lily pads in middle of bog. No inlet or outlet - no running water. Floating moss to edge of pond.</u>	

Approved by HQUSACE 3/92

SOILS

Area F

Map Unit Name (Series and Phase): <u>NW1</u>		Drainage Class: _____ Field Observations Confirm Mapped Type? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Taxonomy (Subgroup): _____			

Profile Description:		Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
Depth (Inches)	Horizon				
0		7.5 YR 3/1	—	None	PT. clay
6		7.5 YR 3/1	—		organic saturated
12		↓	—	↓	material. Top foot
18			—		dominated by rootsys.
24			—	↓	from grasses.

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input checked="" type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: Soil saturated to top; elevation is higher all way around the site. Appears to be low lying drainage site. Surrounded by birch & Road to East blocked off drainage. 37th to South.
 Very mucky. Almost lost a boot.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Remarks: Standing water approx 1 ft. deep down center of it,	

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area G</u> Applicant/Owner: <u>USAF</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/17/05</u> County: <u>EAFB</u> State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Birch "Betula papyrifera"	Tree	FACU	9. _____	_____	_____
2. Alder "Alnus glutinosa"	Tree	FAC	10. _____	_____	_____
3. Sedge "Carex aquatilis"	herb	OBL	11. _____	_____	_____
4. Marsh 5-finger "Potentilla palustris"	herb	OBL	12. _____	_____	_____
5. Alder "Alnus glutinosa"	Shrub	FAC	13. _____	_____	_____
6. Fireweed "Epilobium angustifolium"	Shrub	FACU	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 4/6 = 66%.

Remarks: Stem counts used on herbs. Species are identical to Area F. Samples taken from center of wetland. Plants are healthy. No conditions around wetland that would affect plants.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u>0</u> (in.)</p> <p>Depth to Free Water in Pit: <u>0</u> (in.)</p> <p>Depth to Saturated Soil: <u>0</u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Remarks: <u>Area G is just west of Area F. Both look very similar, split by ²⁴ moraine between wetlands. Drainage patterns seen near hills from runoff. No inlet or outlet.</u></p>	

SOILS

Area 6

Map Unit Name (Series and Phase): _____			Drainage Class: _____		
Taxonomy (Subgroup): _____			Field Observations Confirm Mapped Type? Yes No		

Profile Description:		Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon				
0	7.5 3/4 ↔ O		—	none	PT. Dark
6	↓		—		organic saturated
12	↓		—		material. Top foot
18	↓		—		dominated by root
24	↓		—		sys. from grasses.
					Black color.

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input checked="" type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input checked="" type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: Area surrounded by hills. Appears to be another low-lying drainage for moraines that surround it. Organics assumed to be built up from years of decay - moraines (surrounding hills) made up of silt, sand & cobbles (less organics on hills).

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Remarks:	

Approved by HQUSACE 3/92

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area I</u> Applicant/Owner: <u>EAFB</u> Investigator: <u>Leigh High + Mike Anderson</u>	Date: <u>9/24/05</u> County: <u>EAFB</u> State: <u>AK</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Labrador tea</u>	<u>HERB</u>	<u>FACW</u>	9. _____	_____	_____
2. <u>Spruce LEDUM PALUSTRIS</u>	<u>HERB</u>	_____	10. <u>SPRUCE</u>	<u>TREE</u>	<u>FAC</u>
3. <u>Sedge "Carex"</u>	_____	_____	11. _____	_____	_____
4. <u>Sphagnum moss</u>	<u>HERB</u>	<u>OBL</u>	12. <u>BIRCH PAPER</u>	<u>TREE</u>	<u>FACU</u>
5. _____	_____	_____	13. <u>"BETULA Papyrifera"</u>	_____	_____
6. <u>ALDER</u>	<u>Shrub</u>	<u>FAC</u>	14. _____	_____	_____
7. <u>SPRUCE</u>	<u>Shrub</u>	<u>FAC</u>	15. _____	_____	_____
8. <u>"PICEA MARIANA"</u>	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): _____

Remarks: road on north of wetland.
60% MOSS BIRCH 30%
40% TEA SPRUCE 30%
5/6 = 83% wetland.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p>___ Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p><input checked="" type="checkbox"/> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Remarks: <u>exposed water in center. Appears to have standing water in middle but this wetland is connected to a pond to the west. The pond to the west has an inlet & outlet.</u></p>	

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Area F</u> Applicant/Owner: <u>USAF</u> Investigator: <u>Leigh High & Mike Anderson</u>	Date: <u>9/17/05</u> County: <u>EAFB</u> State: <u>AL</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input type="radio"/> Yes <input checked="" type="radio"/> No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Sedge

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>grasses Carex aquatilis</u>	<u>herb</u>	<u>OBL</u>	9. <u>birch "Betula papyrifera"</u>	<u>Tree</u>	<u>FAC U</u>
2. <u>Marsh Fivefinger "Potentilla palustris"</u>	<u>Herb</u>	<u>OBL</u>	10. <u>Alder "Alnus glutinosa"</u>	<u>Tree</u>	<u>FAC</u>
3. <u>Alder "Alnus glutinosa"</u>	<u>shrub</u>	<u>FAC</u>	11. _____	_____	_____
4. <u>Fireweed "Epi lobium"</u>	<u>shrub</u>	<u>FACU</u>	12. _____	_____	_____
5. <u>"angustifolium"</u>	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): _____

Remarks: Stem counts used. Species are identical to Area G.
4/6 = 66% wetland species.

HYDROLOGY

<p>___ Recorded Data (Describe in Remarks): ___ Stream, Lake, or Tide Gauge <input checked="" type="checkbox"/> Aerial Photographs ___ Other ___ No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: _____ (in.)</p> <p>Depth to Free Water in Pit: _____ (in.)</p> <p>Depth to Saturated Soil: _____ (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><input checked="" type="checkbox"/> Inundated</p> <p><input checked="" type="checkbox"/> Saturated in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water Marks</p> <p>___ Drift Lines</p> <p>___ Sediment Deposits</p> <p>___ Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p>___ Oxidized Root Channels in Upper 12 Inches</p> <p><input checked="" type="checkbox"/> Water-Stained Leaves</p> <p><input checked="" type="checkbox"/> Local Soil Survey Data</p> <p>___ FAC-Neutral Test</p> <p>___ Other (Explain in Remarks)</p>
<p>Remarks: <u>Standing water in middle of lowlying area. No moving water.</u> <u>Area F extends E-W, towards road. Road appears to have interrupted</u> <u>any water movement, if there ever was any.</u></p>	

SOILS

Map Unit Name (Series and Phase): <u>NWI</u>		Drainage Class: _____	
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No	

Profile Description:		Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon				
0"		5 ^{2.5} /1	none	none	Black color.
6"		↓	↓	↓	Predominantly roots
12"					throughout sample
					PT grain size.
					organic soil.

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input checked="" type="checkbox"/> Sulfidic Odor <input checked="" type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)
---	--

Remarks: Top foot dominated by mossy decomposing roots + material. Black in color Area is very large. Bog on east side, connected to a pond on west side. Hills surround area. No human activity nearby a

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle) Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
---	--

Remarks: Although no streams were found on our site investigation, ponds on the west side of the wetland show very high probability of running water such as a stream through this large area.

Approved by HQUSACE 3/92

Attachment 3

Photographic Log



Photo 1: Obligate vegetation. Looking south at Area 1. 9/5/2005



Photo 2: Saturated peat in Area 1. 9/5/2005.



Photo 3: Looking east in Area 1 from west. 9/5/2005.



Photo 4: Standing water common in Area 1. 9/5/2005.



Photo 5: Standing water in Area 1. 9/5/2005.



Photo 6: Poned area in Area 1. 9/5/2005.



Photo 7: Poned area in Area 1. 9/5/2005.



Photo 8: Ditch at edge of Area 1 on north end near road. 9/5/2005.



Photo 9: Standing water in Area 2. 9/5/2005.



Photo 10: Looking south at Area 3. 9/17/2005.



Photo 11: Looking west through Area 2. Moraine splitting small and large bog in the background. 9/5/2005.



Photo 12: Area A. Oversaturated soil and water-stained grasses. 9/17/2005.



Photo 13: Looking south, towards 37th Street, in Area B at standing water in ditch. 9/17/2005.



Photo 14: Looking east towards road from wetland in Area C. 9/17/2005.



Photo 15: Looking west towards Area D. Spruce and alder creeping in towards wetland.
9/17/2005.



Photo 16: Looking south towards Area E. 9/17/2005.



Photo 17: Looking at standing water in Area F. 9/17/2005.



Photo 18: Looking northwest towards Area G. 9/17/2005.



Photo 19: Looking south at Area I. 9/17/2005.



Photo 20: Looking west at Area H. 9/24/2005.

Appendix C

Tribal Coordination

TRIBAL COORDINATION

See sample letter and map.

Tribal Entity Distribution List

Kenaitze Indian Tribe
Rita Smagge
PO Box 988
Kenia, AK 99611

Knik Tribal Council
Carol Theodore
PO Box 871565
Wasilla, AK 99697

Native Village of Chickaloon
Douglas Wade
PO Box 1150
Chickaloon, AK 99674

Native Village of Eklutna
Lee Shephan
Chief Executive Officer
26339 Eklutna Road
Chugiak, AK 99567

Native Village of Tyonek
Connie Burnell
PO Box 82009
Tyonek, AK 99682

Ninilchik Traditional Council
Richard G. Enclewski
15190 Sterling Highway
Ninilchik, AK 99639

Seldovia Village Tribe
Don Kashevaroff
PO Drawer D
Seldovia, AK 99663



U.S. Department
of Transportation
**MARITIME
ADMINISTRATION**

400 Seventh Street, S.W.
Washington, D.C. 20590

Ms. Rita Smagge
Kenaitze Indian Tribe
P.O. Box 988
Kenai, AK 99611

29 SEP 2005

Dear Ms. Smagge:

As you are aware, the Maritime Administration (MARAD) is the lead federal agency for the Port of Anchorage (POA) Intermodal Expansion Project (Project), a major expansion program to support existing and projected new demands for port services. A key component of accomplishing the goals of the redevelopment effort is the requirement of substantial amounts of imported tideland fill to gain the needed acreage.

Commercially procuring, extracting, and transporting this fill material is a major cost in the expansion effort. In order to minimize costs and use material from local sources, the POA expansion team is working with the U.S. Air Force at Elmendorf (EAFB), which has potential undeveloped sources. In June, 2005, we sent correspondence notifying you of the Cherry Hill Borrow Site. We are now initiating Section 106 (National Historic Preservation Act (36 CFR 800)) consultation with the Alaska State Historic Preservation Office (SHPO) regarding the North End Borrow Site, located north of the North/South Runway on EAFB (see enclosed map).

An environmental assessment for the North End Borrow Site is currently being prepared. Information obtained from EAFB indicates that the North End Borrow Site is not known to contain Alaska Native traditional use sites or military historic sites. EAFB staff has requested that cultural resource monitoring occur during the extraction process. If the extraction process uncovers any potential Native artifacts or other cultural resources, EAFB requires that extraction cease and that the EAFB cultural resource officer be notified immediately. In addition, should significant cultural resources be uncovered, MARAD will consult with the SHPO and conduct avoidance or mitigation as required.

As we have done throughout the POA expansion process, we invite you to make us aware of any resources that may be of cultural significance to the Kenaitze Indian Tribe within the proposed extraction area. We have also sent correspondence to the following tribal communities: the Native Village of Chickaloon, Native Village of Tyonek, Native Village of Eklutna, Ninilchik Village Traditional Council, Knik Tribal Council, and the Seldovia Village Tribe.

If you have any questions, please call Daniel Yuska of my staff at 202-366-0714.

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael C. Carter". The signature is fluid and cursive, with the first name "Michael" being more prominent.

Michael C. Carter, Director
Office of Environmental Activities

Enclosure (1)

cc: R. Graves, POA

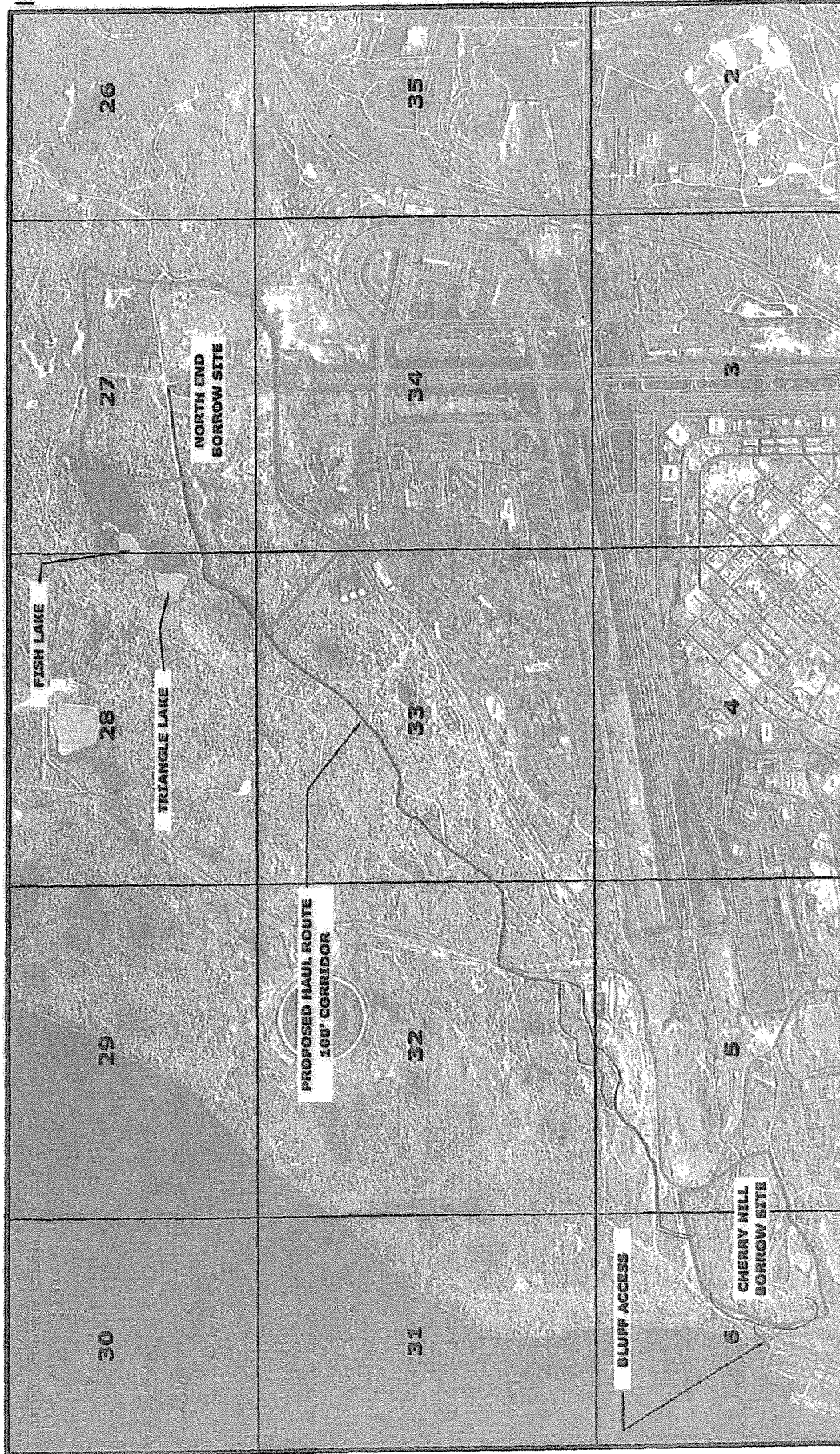


FIGURE 2

ELMENDORF GRAVEL EXTRACTION
BORROW SITES

19 SEP 2005

Anchorage Port
Expansion Team



Appendix D

Resource Agency Coordination



U.S. Department
of Transportation
**MARITIME
ADMINISTRATION**

400 Seventh Street, S.W.
Washington, D.C. 20590

Ms. Judith Bittner
Chief, Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

29 SEP 2005

Dear Ms. Bittner:

As you are aware, the Maritime Administration (MARAD) is the lead federal agency for the Port of Anchorage (POA) Intermodal Expansion Project (Project), a major expansion program to support existing and projected new demands for port services. A key component of accomplishing the goals of the redevelopment effort is the requirement of substantial amounts of imported tideland fill to gain the needed acreage.

Commercially procuring, extracting, and transporting this fill material is a major cost in the expansion effort. In order to minimize costs and use material from local sources, the POA expansion team is working with the U.S. Air Force at Elmendorf (EAFB), which has potential undeveloped sources. Two locations being investigated on Elmendorf are the Cherry Hill Borrow Site and the North End Borrow Site. On July 14, 2005, MARAD received concurrence from your office for the Cherry Hill Borrow Site. In accordance with Section 106 of the National Historic Preservation Act (36 CFR 800), we are hereby initiating consultation regarding the North End Borrow Site, located north of the North/South Runway on EAFB (see enclosed map).

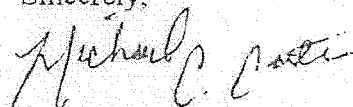
An environmental assessment for the North End Borrow Site is currently being prepared. Information obtained from EAFB indicates that the North End Borrow Site is not known to contain Alaska Native traditional use sites or military historic sites. EAFB staff has requested that cultural resource monitoring occur during the extraction process. If the extraction process uncovers any potential Native artifacts or other cultural resources, EAFB requires that extraction cease and that the EAFB cultural resource officer be notified immediately. In addition, should significant cultural resources be uncovered, MARAD will consult with the State Historic Preservation Officer (SHPO) and conduct avoidance or mitigation as required.

As part of the cultural and historic resource identification process, we are cooperating with the EAFB cultural resource and environmental office as well as sending letters to the native tribes within the Project area requesting their input. The list of native and tribal communities that will receive correspondence are the Native Village of Eklutna, Native

Village of Tyonck, Knik Tribal Council, Ninilchik Village Traditional Council, Seldovia Village Tribe, Native Village of Chickaloon, and the Kenaitze Indian Tribe.

We look forward to working with you on this matter. Please call me or Daniel Yusk1 of my staff at 202-366-8887, if you have any questions.

Sincerely,

A handwritten signature in dark ink, appearing to read "Michael C. Carter". The signature is fluid and cursive, with the first name "Michael" being the most prominent.

Michael C. Carter, Director
Office of Environmental Activities

Enclosure (1)

cc: R. Graves, POA
V. Payne, EAFB

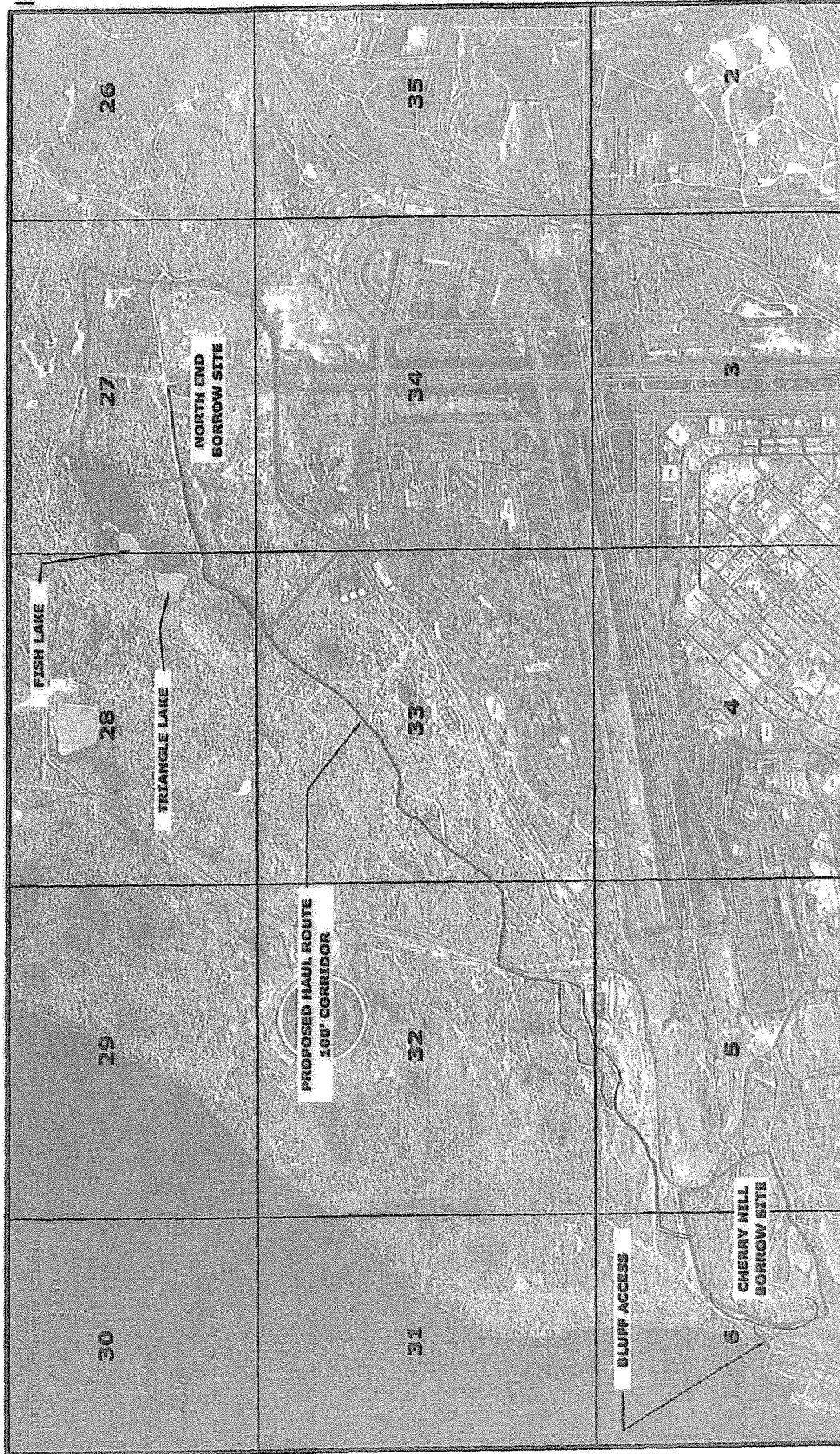


FIGURE 2

ELMENDORF GRAVEL EXTRACTION
BORROW SITES

19 SEP 2005

Anchorage Port
Expansion Team

